United States
Department of
Agriculture

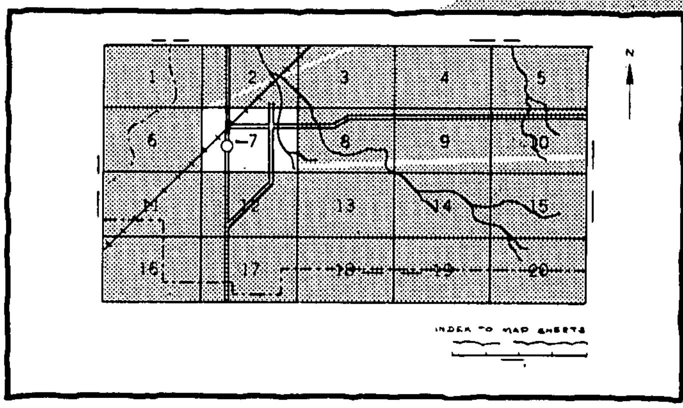
Soil
Conservation
Service

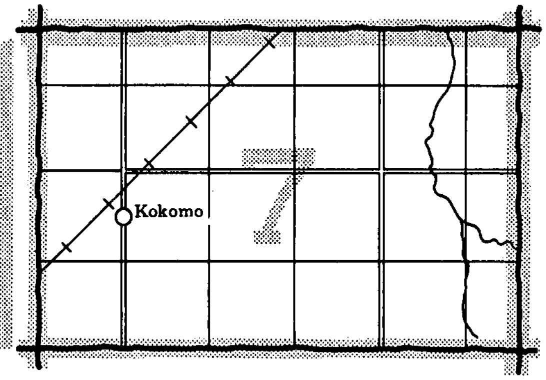
In cooperation with
Illinois Agricultural
Experiment Station

Soil Survey of Madison County, Illinois

HOW TO USE

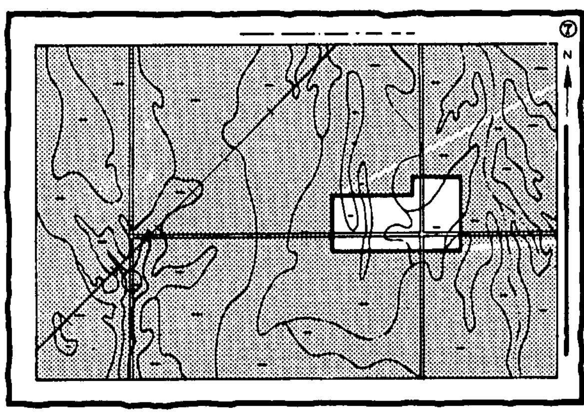
1. Locate your area of interest on the "Index to Map Sheets."

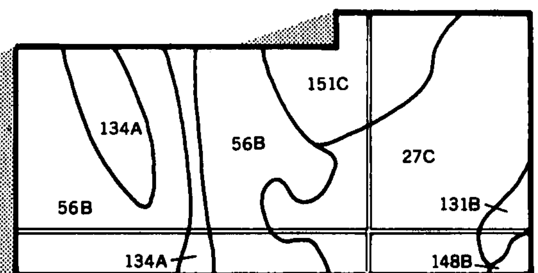




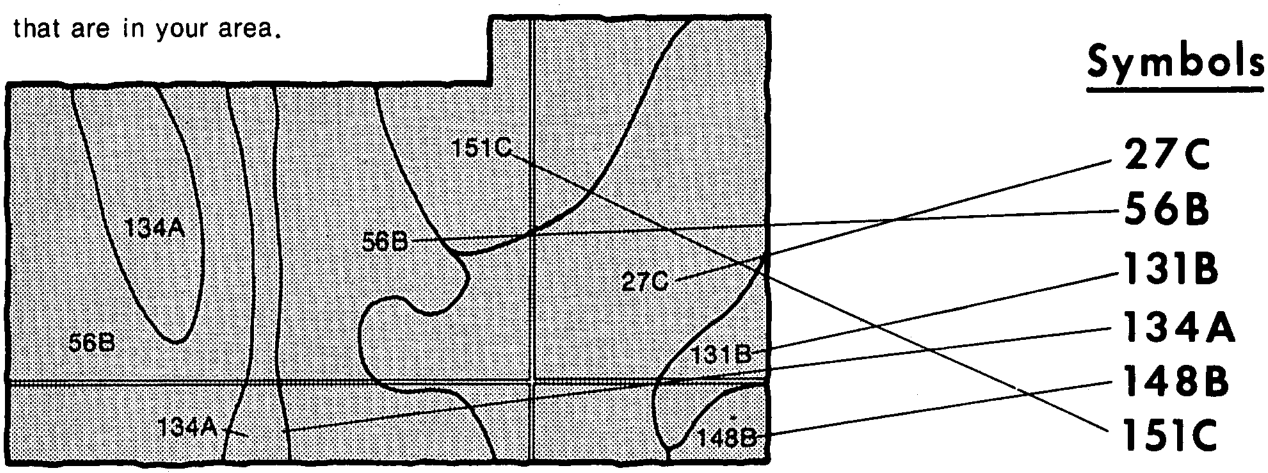
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



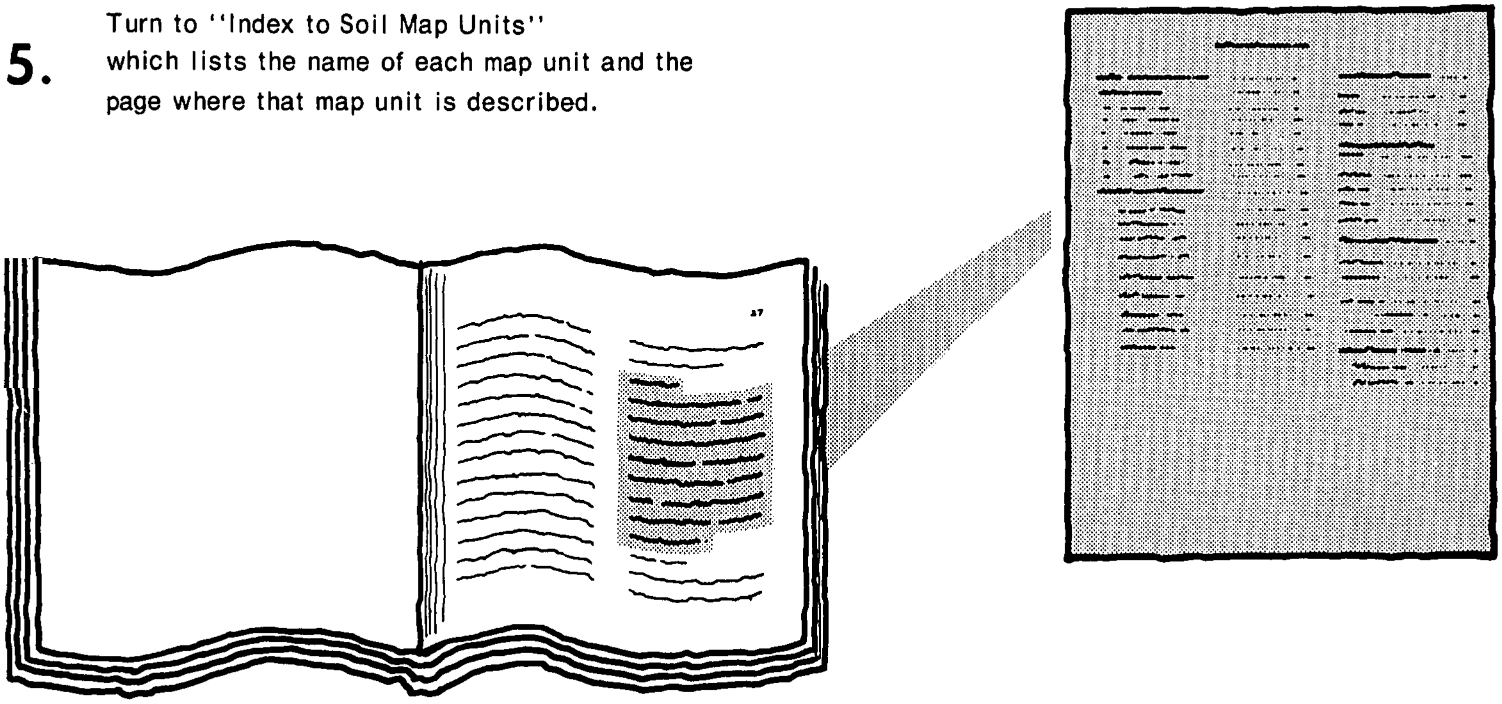


4. List the map unit symbols that are in your area.

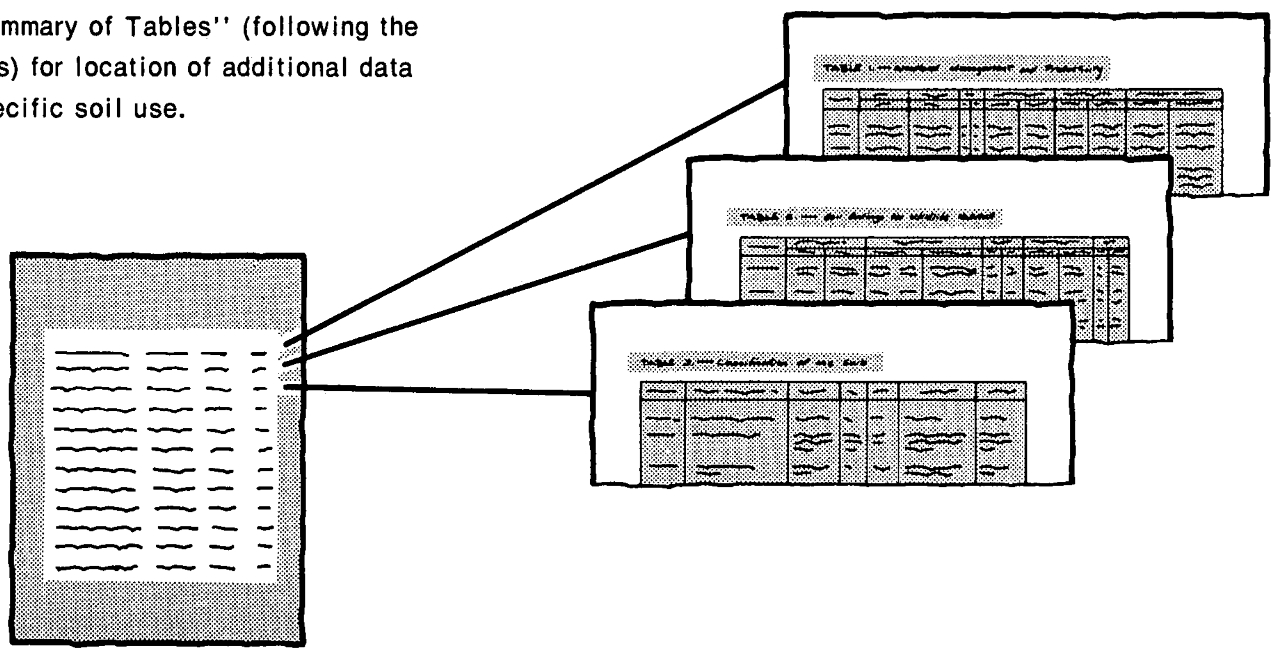


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; for specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1981. Soil names and descriptions were approved in 1982. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Madison County Soil and Water Conservation District. The cost was shared by the Madison County Board.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This soil survey is Illinois Agricultural Experiment Station Soil Report No. 120.

Cover: A protective cover of grasses and legumes on a moderately sloping Elco silty clay loam in an area of the Hickory-Elco-Rozetta association.

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Soil Series

Issued March 1986

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Summary of Tables

Foreword

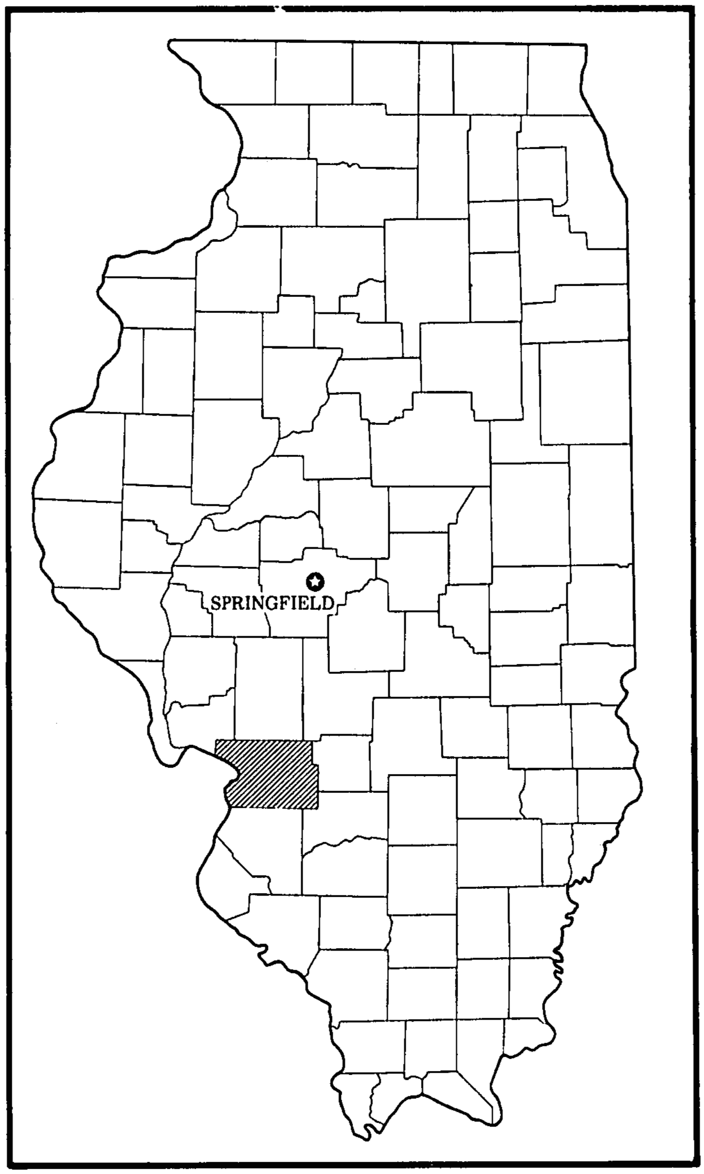
This soil survey contains information that can be used in land-planning programs in Madison County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

John J. Eckes
State Conservationist
Soil Conservation Service



Location of Madison County in Illinois.

Soil Survey of
Madison County, Illinois

By T. M. Goddard and Larry R. Sabata, Soil Conservation Service

Fieldwork by T. M. Goddard, John C. Doll, Paul W. Youngstrum, and Irene A. Watterson, Soil Conservation Service, and David B. Rahe, Randy A. Leeper, and Greg Cooper, Madison County, Illinois

United States Department of Agriculture, Soil Conservation Service, in cooperation with
the Illinois Agricultural Experiment Station

MADISON COUNTY is in the southwestern part of Illinois. It has an area of 476,800 acres, or about 745 square miles. The Mississippi River forms the western boundary. Edwardsville is the county seat. Other important cities are Alton, Granite City, and Collinsville.

General Nature of the County

This section gives general information about the county. It describes the natural resources; physiography, relief, and drainage; settlement; farming; and climate.

Natural Resources

The most abundant natural resources in Madison County, other than soil, are limestone, sand and gravel, coal, oil, timber, and water. Coal is the most important mineral in southwestern Illinois. It was mined in the county from 1882 to 1964. The total production during this period was 164,295,772 tons. The county has 615,350 tons of coal reserves (*9*). It currently has no active mines.

Oil production began in the county in 1909. Since that time, 16,474,600 barrels of crude oil have been produced. At present, the county has eight oil fields. It has about 222 producing wells. It accounts for about 5 percent of the total state production (*9*).

Limestone is a valuable mineral mined in Madison County. Limestone outcrops are mainly on the bluffs in the area near the city of Alton to the Jersey County line, but they are also common along the major streams, such as Cahokia Creek, Silver Creek, and Sugar Creek. The most marketable limestone is that of Mississippian age, which is in the northwestern part of the county, on the bluffs along the Mississippi River. The limestone in the eastern part of the county is less pure and is of Pennsylvanian age. At present, all limestone production is in the Alton-Godfrey area. Two open pit quarries and one underground mine are active. The limestone is used for portland cement, concrete aggregate, lime, railroad ballast, riprap, building stone, crushed stone, and filter beds (*3*).

The county has four active sand and gravel pits (*9*). Most of the sand deposits are on the terraces adjacent to the bottom land along the Mississippi River. The main source of gravel is the Hagarstown drift deposits on hills and ridges in the eastern part of the county. The gravel pits are normally in areas where the overburden is thin. They are close to commercial markets. The sand and gravel are used as road, building, and fill material and as railroad ballast.

About 54,200 acres in the county, or more than 11 percent of the total acreage, is forested (*5*). The number of board feet on this acreage is about 175,065. These mixed, deciduous forests have a wide variety of tree species. Those on uplands are dominated by oaks and hickories, and those on bottom land are dominated by silver maple, cottonwood, pin oak, sycamore, pecan, box elder, and ash (*9*).

The industries and municipalities on the flood plains along the Mississippi River obtain their water directly from the river or from valley fill material on the flood plains. The valley fill material along Silver Creek also is an important source of ground water. Aquifers in the

Mississippian-age limestone in the northwestern part of the county are good sources of water for farm and domestic purposes. Bedrock aquifers do not occur in the northeastern part of the county. Scattered sand and gravel aquifers in the underlying till plain deposits, however, supply wells with moderate amounts of water for small communities and rural households. Drinking water for most rural households is supplied by low-yielding wells that are 35 to 150 feet deep. Four reservoirs, which range from 125 to 2,500 acres, are an additional source of water for municipal, industrial, and recreational purposes. The numerous ponds throughout the county supply ample water for livestock.

Physiography, Relief, and Drainage

Madison County has an extremely wide variety of topographic features. The major features are the upland till plains and bluffs and the alluvial Mississippi River Valley, known as the American Bottoms.

The highly urbanized American Bottoms makes up about 14 percent of the county. It occurs as three major areas. The first area consists of alternating narrow ridges and swales. It is adjacent to the river and is quite extensive in the southwestern part of the county (*15*). The second area consists of terraces and foot slopes adjacent to bluffs. It includes the colluvial foot slopes between the bluffs and the floor of the valley. The terraces, known as the Poag and Woodriver Terraces, are relatively large, are elevated, and have moderately steep escarpments. The third area consists of very broad flats and depressions. It is between the terraces and the ridges and swales. It extends from Woodriver to the northeastern part of Horseshoe Lake. It is characterized by broad swales, sloughs, and backwater marshes. The soils in this area are high in clay content, are poorly drained, and are often ponded.

The uplands are loess-covered glacial till plains. The thickest loess deposits, 40 to 80 feet thick, are on the bluffs. The loess thins to 5 feet in the northeast corner of the county. Limestone outcrops are quite common in the bluff area northwest of Alton. This highly weathered limestone is responsible for small areas of karst topography, which is characterized by sinkholes.

The bluff area is highly dissected. It has long, narrow ridges and steep side slopes. East of the bluffs, the ridges are rather broad and the side slopes are less sloping. This gently sloping landscape has a thick layer of loess. To the east and northeast is a broad, level plain that has a few low lying knolls and ridges and is dissected by many small creeks.

The bluffs are as high as 650 feet above sea level. On the American Bottoms, the swales are as low as 400 feet and the ridges are about 425 feet above sea level. The elevation of the broad, level ridges is about 620 feet above sea level in the northeastern part of the county and gradually decreases to about 540 feet in the southeast corner.

Water in the main drainageways in the county flows to the south and west. Woodriver Creek and Cahokia Creek drain the western half of the county and empty directly into the Mississippi River. Silver Creek and a small part of Sugar Creek drain the eastern half of the county and flow south into the Kaskaskia River, which drains into the Mississippi River.

Settlement

During prehistoric times, Madison County was inhabited by Indians who built the largest manmade earthen mound in North America, now called Monks Mound. These Indians were replaced by a loose confederation of several peaceful Indian tribes, whom the French encountered when they first explored the area in 1673. The French did not seriously try to settle the area but occupied it until 1765, when the British arrived. British occupation lasted until 1778, when George Rogers Clark arrived and claimed the area for Virginia (*10*). The first American settlers came from Kentucky, Virginia, Tennessee, and the Carolinas.

Development of the county was accelerated by two separate events in the 1800's. The first was the introduction of new scientific methods of farming brought by German settlers in the 1830's. These new methods spurred agricultural production. The second was the expansion of industries in the early 1870's, particularly the steel and oil industries.

Farming

The rich alluvial soils on the bottom land along the Mississippi River and the soils that formed in a thick layer of loess on uplands have always provided Madison County with abundant farmland. The original settlers first planted peach and apple orchards, grape vineyards, wheat, oats, corn, and melons. Although the orchards and vineyards have largely disappeared, corn, wheat, and soybeans are grown extensively. Sorghum also is grown, and many acres are used for horseradish, sweet corn, tomatoes, onions, potatoes, berries, and fruits. Madison County is the largest producer of horseradish in the United States.

Climate

Peter Vinzani, weather observer, State Water Survey Division, Illinois Institute of National Resources, helped prepare this section.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Alton Dam in the period 1951 to 1978. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 31 degrees F, and the average daily minimum temperature is 23 degrees. The lowest temperature on record, which occurred at Alton Dam on January 17, 1977, is -15 degrees. In summer the average temperature is 77 degrees, and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred on July 14, 1954, is 111 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation averages 36.82 inches. Of this, 22 inches, or 60 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 18 inches. The heaviest 1-day rainfall during the period of record was 4.68 inches at Alton Dam on July 16, 1952. Thunderstorms occur on about 50 days each year.

The average seasonal snowfall is about 16 inches. The greatest snow depth at any one time during the period of record was 19 inches. On the average, 10 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in summer.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over

long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

The soil survey of Madison County joins the soil surveys of Montgomery, Bond, Jersey, and St. Clair Counties. In places the soil names on both the general soil map and the detailed maps do not agree across the county line because of map scale differences, which change the degree of detail that can be mapped, or because some of the soils in one county were not of sufficient extent to be identified in the other county. The soils on one side of the county line are similar to those on the other side and have similar potentials for the major land uses.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

Nearly Level to Moderately Sloping, Moderately Well Drained to Poorly Drained Soils on Uplands

These soils formed in loess. They are used primarily for cultivated crops. Wetness is the principal limitation. Erosion also is a management concern.

1. Virden-Piasa-Darmstadt Association

Nearly level to moderately sloping, poorly drained and somewhat poorly drained soils that have a moderately slowly permeable or very slowly permeable subsoil; formed in loess on uplands

This association is on broad plains originally covered dominantly by prairie grasses. It is in the northeastern part of the county. Slopes range from 0 to 8 percent.

This association makes up about 21 percent of the county. It is about 35 percent Virden and similar soils, 20 percent Piasa soils, 15 percent Darmstadt soils, and 30 percent soils of minor extent (fig. 1).

The nearly level Virden soils are on broad upland plains and interstream divides. They commonly occur as areas adjacent to and in complex patterns with areas of the Piasa soils. The Virden soils are poorly drained and are moderately slowly permeable in the subsoil. Typically, the surface layer is black silty clay loam about 9 inches thick. The subsurface layer is black, mottled silty clay loam about 6 inches thick. The subsoil is mottled silty clay loam about 40 inches thick. The upper part is black, and the lower part is grayish brown. The underlying material to a depth of 60 inches is grayish brown, mottled silt loam.

The nearly level Piasa soils are on broad flats and in depressional areas. They commonly occur as areas adjacent to and in complex patterns with areas of Virden and Herrick soils. The Piasa soils are poorly drained and are very slowly permeable in the subsoil. Typically, the surface layer is very dark gray silt loam about 8 inches thick. The subsurface layer is dark grayish brown silt loam about 4 inches thick. The subsoil has a high concentration of sodium. It is mottled silty clay loam about 43 inches thick. The upper part is dark grayish brown, the next part is olive gray, and the lower part is light olive gray. The underlying material to a depth of 60 inches is olive gray, mottled silt loam.

Darmstadt soils are gently sloping on upland ridges and moderately sloping on side slopes along shallow drainageways. They are somewhat poorly drained and are very slowly permeable in the subsoil. Typically, the surface layer is dark brown, friable silt loam about 6 inches thick. The subsoil has a high concentration of sodium. It is about 43 inches thick. The upper part is brown, mottled, firm silty clay. The next part is pale brown and light brownish gray, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silty clay loam. The underlying material to a depth of 60 inches is light gray, mottled silt loam.

Minor in this association are Cowden, Herrick, Huey, Marine, Oconee, and Rushmore soils. The poorly drained Cowden soils have a dark surface layer that is less than 10 inches thick. They are on broad flats. The poorly drained Huey soils have less clay in the subsoil than the Piasa soils. They are in nearly level or depressional areas. The somewhat poorly drained Herrick, Marine, and Oconee soils have more clay in the subsoil than the Darmstadt soils. They are on ridges between drainageways. The poorly drained Rushville soils have a light colored surface layer and are in nearly level or depressional areas.

Most areas of this association are used for soybeans, corn, or wheat. Improving drainage, controlling water erosion, and improving fertility are the main management concerns.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness,

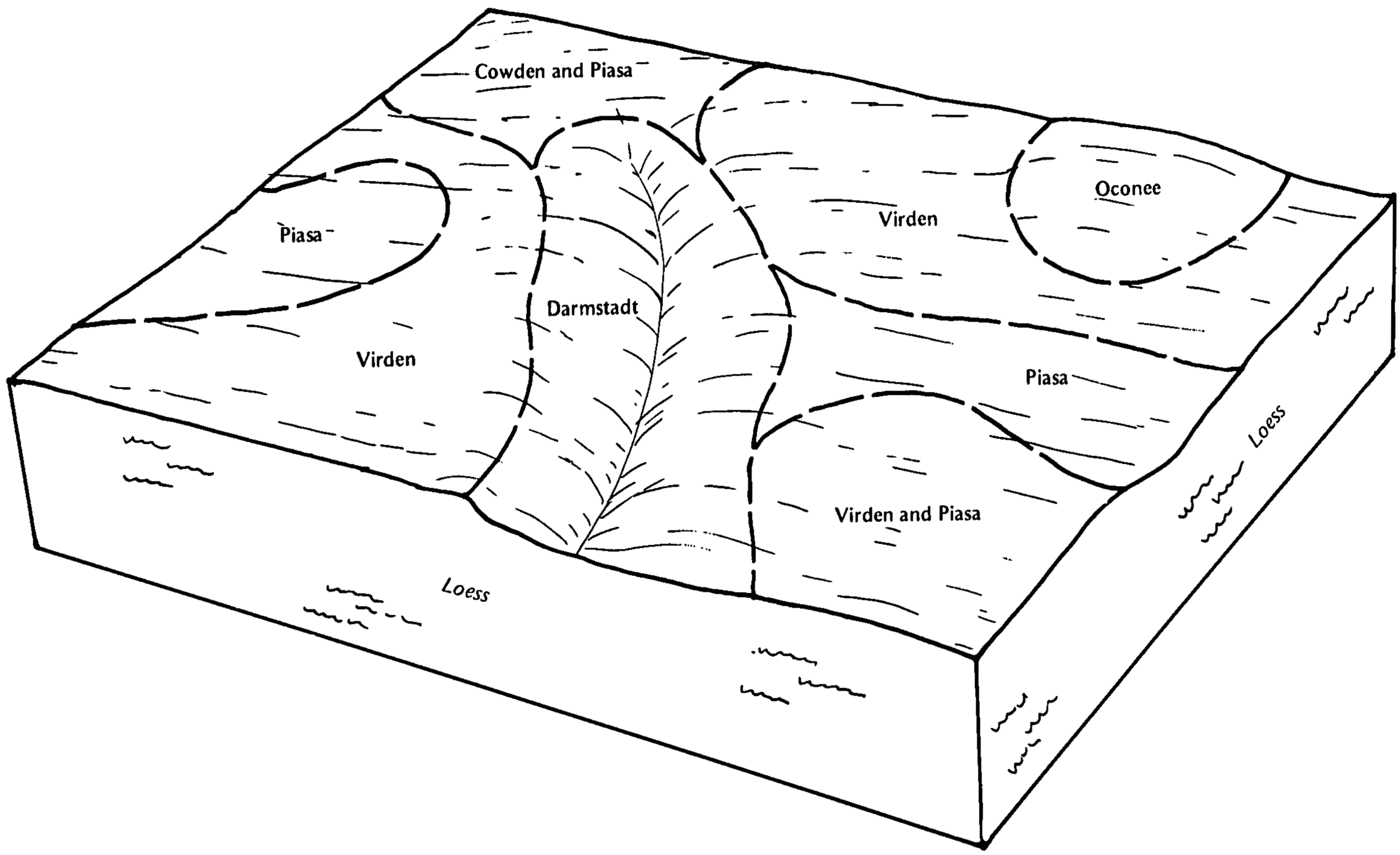


Figure 1.—Typical pattern of soils and underlying material in the Virden-Piasa-Darmstadt association.

the shrink-swell potential, permeability, and the excess sodium are the main management concerns in areas used for urban development.

2. Muscatine-Atterberry-Downs Association

Gently sloping and moderately sloping, somewhat poorly drained and moderately well drained soils that have a moderately permeable subsoil; formed in loess on uplands

This association is on upland plains and convex ridges, which were originally covered dominantly by mixed prairie grasses and deciduous forest. Slopes range from 1 to 10 percent.

This association makes up about 4 percent of the county. It is about 40 percent Muscatine soils, 20 percent Atterberry soils, 15 percent Downs soils, and 25 percent soils of minor extent (fig. 2).

The gently sloping Muscatine soils are on ridges and knolls. They are somewhat poorly drained. Typically, the surface layer is very dark grayish brown silt loam about 15 inches thick. The subsoil is mottled silty clay loam about 34 inches thick. The upper part is dark grayish brown, the next part is grayish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light brownish gray, mottled silt loam.

The gently sloping Atterberry soils are on ridges and knolls. They are somewhat poorly drained. Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark grayish brown and grayish brown, mottled silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown, mottled silty clay loam. The next part is grayish brown, mottled silty clay loam. The lower part of the Atterberry soils is grayish brown, mottled silt loam.

The gently sloping and moderately sloping Downs soils are on ridges, knolls, and side slopes. They are moderately well drained. Typically, the surface layer is very dark grayish brown silt loam about 7 inches thick. The subsurface layer is dark brown silt loam about 4 inches thick. The subsoil extends to a depth of 60 inches. It is dark yellowish brown. The upper part is silt

loam, the next part is silty clay loam, and the lower part is mottled silty clay loam and silt loam.

Minor in this association are Rozetta, Herrick, Sable, and Virden soils. Rozetta soils are moderately well drained, have a light colored surface layer, and are gently sloping on ridges and more sloping on side slopes along drainageways. Herrick soils are somewhat poorly drained and have a silty clay loam subsoil. They are gently sloping and are on ridges. Sable and Virden soils are poorly drained and are on upland flats.

Most areas of this association are used for soybeans, corn, or wheat. Controlling water erosion and improving fertility are the main management concerns.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, permeability, and slope are the main management concerns in areas used for urban development.

3. Marine-Rozetta-Stronghurst Association

Nearly level and gently sloping, somewhat poorly drained and moderately well drained soils that have a slowly permeable or moderately permeable subsoil; formed in loess on uplands

This association is on drainage divides in areas which were originally covered dominantly by deciduous forest. It is on convex ridges and the adjoining upland flats. The ridges have long, gentle slopes. Slopes range from 0 to 5 percent.

This association makes up about 10 percent of the county. It is about 30 percent Marine soils, 25 percent Rozetta soils, 20 percent Stronghurst soils, and 25 percent soils of minor extent.

The nearly level and gently sloping Marine soils are on the broader ridges and knolls. They are somewhat poorly drained and are slowly permeable in the subsoil. Typically, the surface layer is dark grayish brown silt loam about 9 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, mottled silty clay. The next part is grayish brown, mottled silty clay loam. The lower part is light brownish gray, mottled silty clay loam and silt loam.

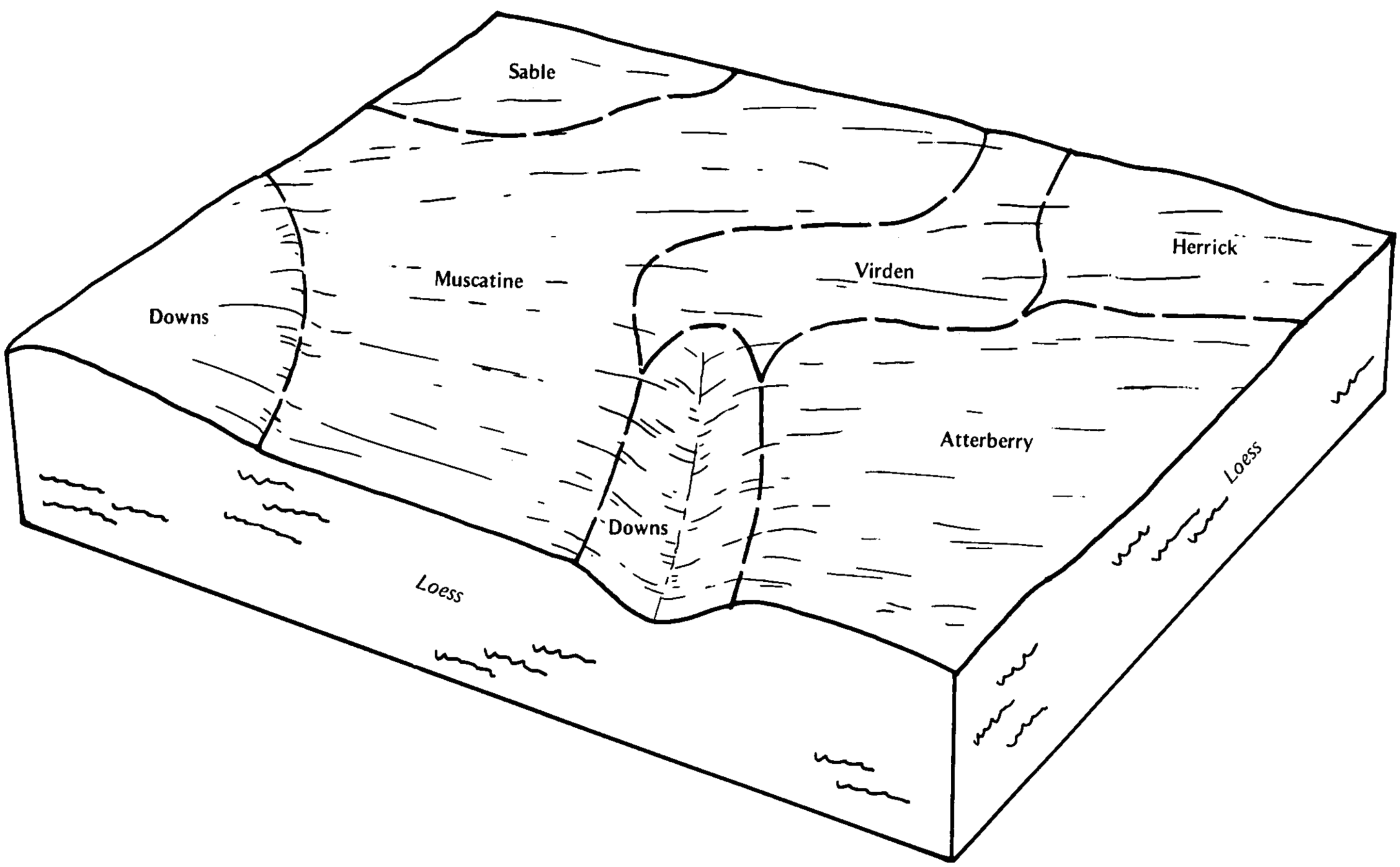


Figure 2.—Typical pattern of soils and underlying material in the Muscatine-Atterberry-Downs association.

The gently sloping Rozetta soils are on ridgetops. They are moderately well drained and are moderately permeable in the subsoil. Typically, the surface layer is brown silt loam about 8 inches thick. The subsurface layer also is brown silt loam. It is about 5 inches thick. The subsoil is silty clay loam about 45 inches thick. The upper part is yellowish brown, the lower part is yellowish brown and brown and is mottled. The underlying material to a depth of 60 inches is light grayish brown, mottled silt loam.

Stronghurst soils are nearly level on the broader upland flats and gently sloping on convex ridges. They are somewhat poorly drained and are moderately permeable in the subsoil. Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The subsurface layer is grayish brown silt loam about 10 inches thick. The subsoil is about 38 inches thick. The upper part is brown and pale brown, mottled silty clay loam. The next part is light brownish gray, mottled silty clay loam. The lower part is light brownish gray, mottled silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled silt loam.

Minor in this association are Fayette, Hosmer, Rushville, and Weir soils. Fayette soils are similar to Rozetta soils but are well drained. They are on upland ridges. Hosmer soils are moderately well drained, have fragipan characteristics in the subsoil, and are on upland ridges. Rushville and Weir soils are poorly drained and are in nearly level or depressional areas.

Most areas of this association are used for soybeans, corn, or wheat. Improving drainage, controlling water erosion, and improving fertility are the main management concerns.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, and permeability are the main management concerns in areas used for urban development.

Gently Sloping to Steep, Well Drained and Moderately Well Drained Soils on Uplands

These soils formed in loess, glacial till, and loess over an older buried soil. Erosion is the principal hazard. The less sloping soils are used primarily for cultivated crops, and the more sloping soils are used for hay, pasture, or woodland.

4. Fayette-Rozetta Association

Gently sloping to steep, well drained and moderately well drained soils that have a moderately permeable subsoil; formed in loess on uplands

This association is on narrow upland ridges and valley side slopes, which were originally covered dominantly by deciduous forest. Slopes range from 2 to 30 percent.

This association makes up about 24 percent of the county. It is 45 percent Fayette soils, 35 percent Rozetta soils, and 20 percent soils of minor extent (fig. 3).

The gently sloping to steep Fayette soils are on side slopes. They are well drained. Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsurface layer is brown and yellowish brown silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark yellowish brown silt loam and silty clay loam. The lower part is yellowish brown silty clay loam.

The gently sloping to strongly sloping Rozetta soils are on ridges and side slopes. They are moderately well drained. Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is about 49 inches thick. It is dark yellowish brown silty clay loam in the upper part; brown and grayish brown, mottled silty clay loam in the next part; and grayish brown, mottled loam in the lower part. The underlying material to a depth of 60 inches is light brownish gray, mottled silt loam.

Minor in this association are Bold, Hickory, Stronghurst, Sylvan, and Wakeland soils. The strongly sloping to steep Bold soils are well drained, are calcareous silt loam throughout, and are on side slopes. The strongly sloping to steep Hickory soils are well drained and formed in glacial till on side slopes. The nearly level and gently sloping Stronghurst soils are somewhat poorly drained and are on upland divides. Sylvan soils are similar to Fayette soils but have carbonates within 35 inches of the surface. They are strongly sloping to steep and are on side slopes. Wakeland soils are somewhat poorly drained and formed in silty alluvial sediment on narrow bottoms adjoining the uplands.

Most areas of the gently sloping and moderately sloping soils are used for corn, soybeans, or wheat. Most areas of the strongly sloping to steep soils are used for hay, pasture, or woodland. Controlling water erosion and improving fertility are the main management concerns.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, permeability, and slope are the main management concerns in areas used for urban development.

5. Hickory-Elco-Rozetta Association

Moderately sloping to steep, well drained and moderately well drained soils that have a moderately permeable or moderately slowly permeable subsoil; formed in glacial till, loess, and loess over an older buried soil; on uplands

This association is on narrow upland ridges and on valley side slopes, which were originally covered dominantly by deciduous forest. Slopes range from 5 to 30 percent.

This association makes up about 17 percent of the county. It is about 35 percent Hickory soils, 15 percent Elco soils, 10 percent Rozetta soils, and 40 percent soils of minor extent (fig. 4).

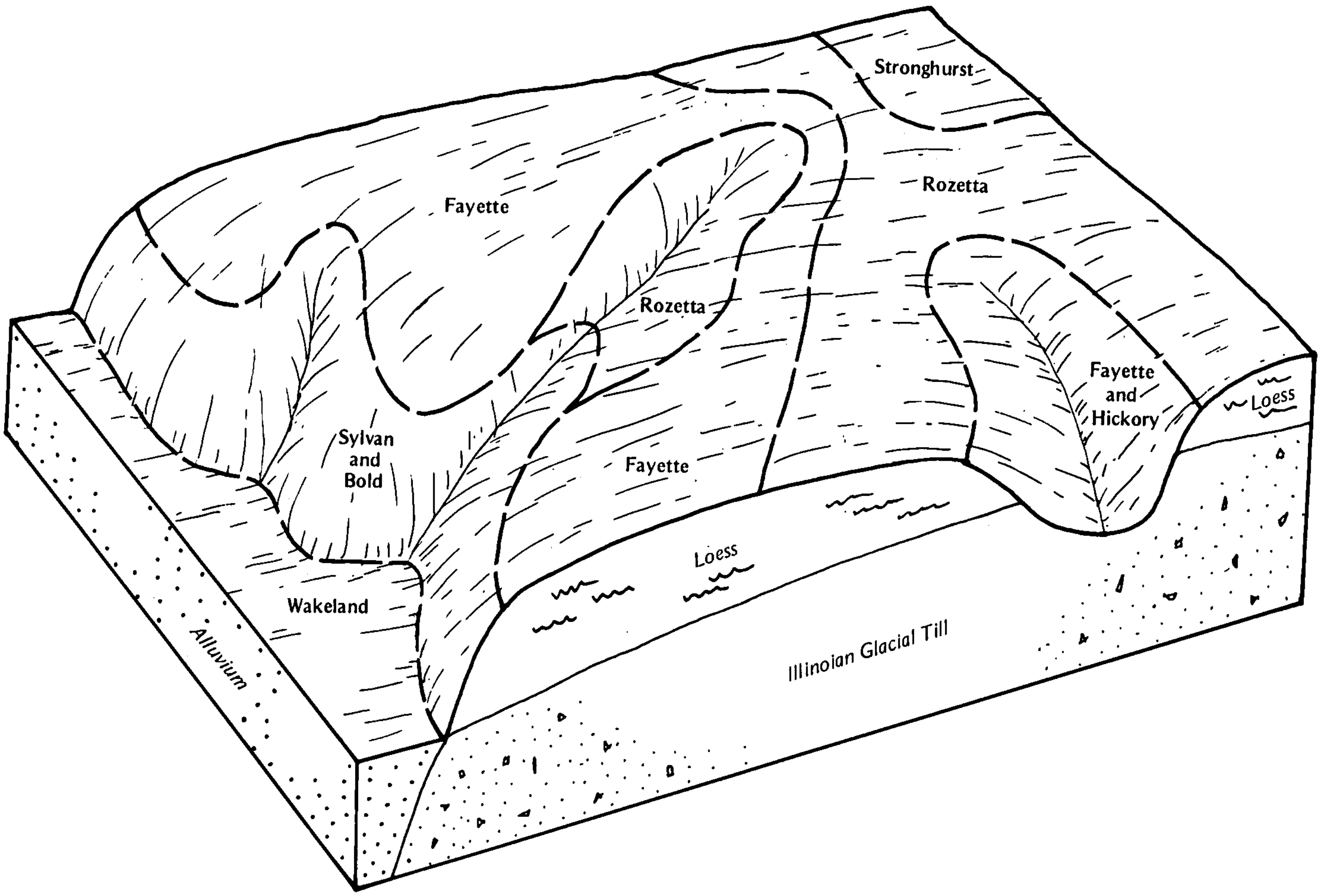


Figure 3.—Typical pattern of soils and underlying material in the Fayette-Rozetta association.

The moderately steep and steep Hickory soils formed mostly in a thin layer of loess and the underlying glacial till. They are on side slopes. They are well drained and are moderately permeable in the subsoil. Typically, the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsurface layer is yellowish brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark yellowish brown, mottled loam. The lower part is yellowish brown, mottled, firm and friable clay loam.

The moderately sloping and strongly sloping Elco soils formed in loess and the underlying Sangamon paleosol. They are on side slopes and are moderately well drained. They are moderately permeable in the upper part of the subsoil and moderately slowly permeable in the lower part. Typically, the surface layer is dark brown silty clay loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown and dark yellowish brown, mottled silty clay loam. The lower part is pale brown and light brownish gray, mottled clay loam.

The moderately sloping and strongly sloping Rozetta soils formed in loess on side slopes and ridges. They are moderately well drained and are moderately permeable in the subsoil. Typically, the surface layer is dark yellowish brown silty clay loam about 7 inches thick. The subsoil is about 38 inches thick. It is yellowish brown silty clay loam in the upper part and yellowish brown, mottled silt loam in the lower part. The underlying material to a depth of 60 inches is brown, mottled silt loam.

Minor in this association are Atlas, Grantfork, Hosmer, Marine, Orion, and Wakeland soils. The moderately sloping and strongly sloping Atlas soils have a very firm clay subsoil, are somewhat poorly drained, and are on side slopes. The moderately sloping and strongly sloping

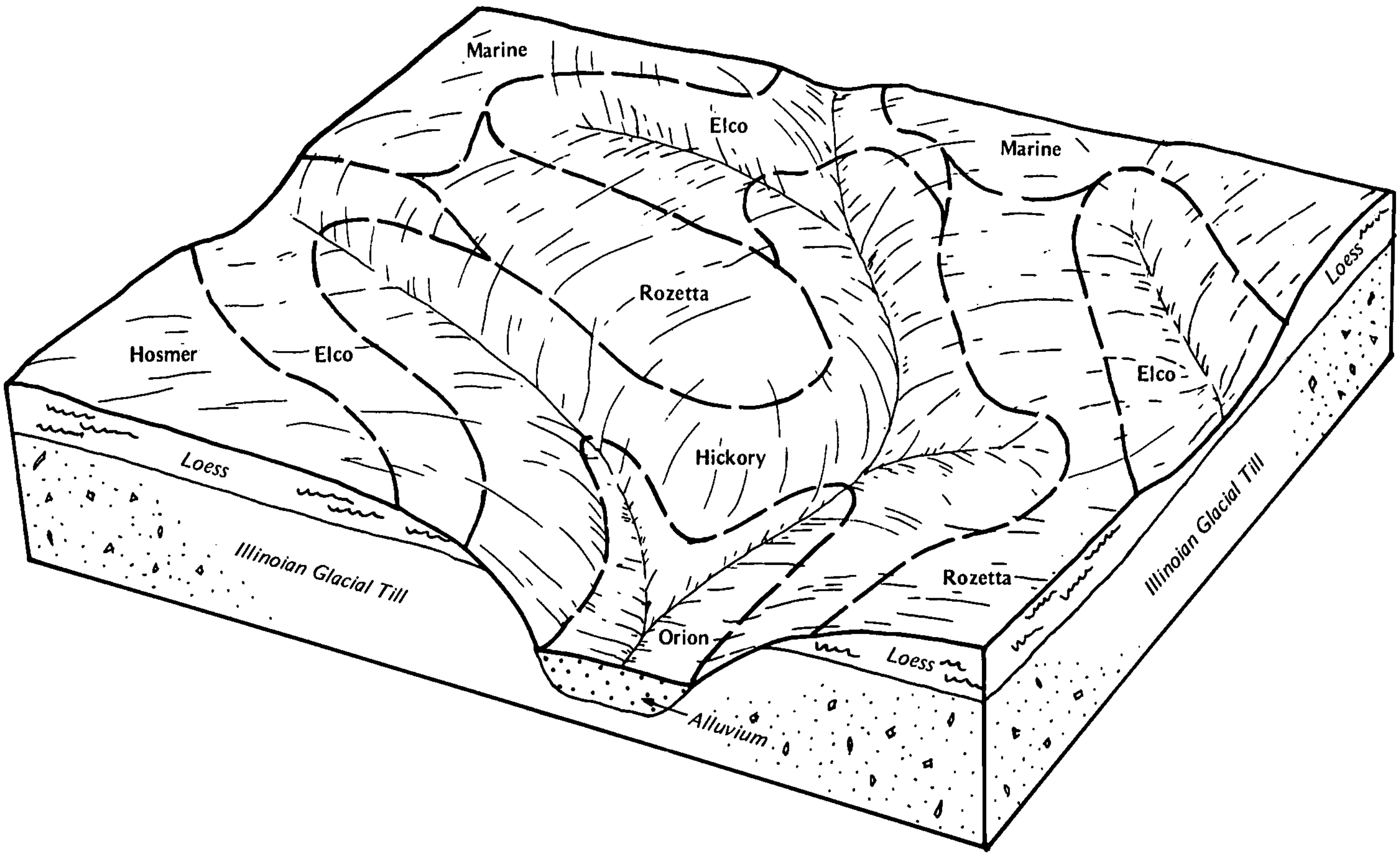


Figure 4.—Typical pattern of soils and underlying material in the Hickory-Elco-Rozetta association.

Grantfork soils are somewhat poorly drained, have a high concentration of sodium in the subsoil, and are on side slopes. Hosmer soils are moderately well drained, have fragipan characteristics in the subsoil, and are on upland ridges. The nearly level and gently sloping Marine soils formed in loess, are somewhat poorly drained, and are on the broader ridges. Orion and Wakeland soils are somewhat poorly drained. These soils formed in silty alluvial sediment on narrow bottoms adjoining the uplands.

Most areas of the gently sloping and moderately sloping soils are used for corn, soybeans, or wheat. Most areas of the strongly sloping to steep soils are used for hay, pasture, or woodland. Controlling water erosion and improving fertility are the main management concerns on these soils.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, permeability, and slope are the main management concerns in areas of the Hickory-Elco-Rozetta Association that are used for urban development.

Nearly Level to Moderately Sloping, Well Drained to Very Poorly Drained Soils on Flood Plains, Terraces, and Foot Slopes

These soils formed in mixed alluvial sediment. They are used primarily for cultivated crops and urban development. Flooding is the principal hazard. Erosion and drought also are hazards. Wetness is the principal limitation.

6. Wakeland-Birds-Orion Association

Nearly level, somewhat poorly drained and poorly drained soils that are moderately permeable or moderately slowly permeable; formed in silty alluvial sediment on flood plains

This association is on bottom land along the major streams and tributaries. It is frequently flooded for brief periods. The native vegetation was dominantly deciduous forest. Many areas have been cleared. Slopes range from 0 to 2 percent.

This association makes up about 10 percent of the county. It is about 30 percent Wakeland soils, 25 percent

Birds soils, 15 percent Orion soils, and 30 percent soils of minor extent.

Wakeland soils are on the higher parts of the bottom land along the major streams and tributaries. They are somewhat poorly drained and moderately permeable. Typically, the surface layer is dark grayish brown silt loam about 8 inches thick. The underlying material to a depth of 60 inches is stratified, mottled silt loam. The upper part is dark grayish brown, and the lower part is grayish brown.

Birds soils are on the lower parts of the bottom land along the major streams. They are poorly drained and moderately slowly permeable. Typically, the surface layer is dark gray, mottled silt loam about 8 inches thick. The underlying material to a depth of 60 inches is stratified, silty deposits. The upper part is gray, dark gray, and very dark gray, mottled silt loam and silty clay loam. The lower part is gray and mottled light gray and light brownish gray silt loam.

Orion soils are on the higher parts of the bottom land along streams and tributaries. They are somewhat poorly drained and moderately permeable. Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The upper part of the underlying material is stratified grayish brown, brown, and dark grayish brown, mottled silt loam. The lower part to a depth of 60 inches is a buried soil of very dark gray, very dark grayish brown, and dark grayish brown, mottled silt loam.

Minor in this association are Beaucoup, Haymond, Lawson, and Tice soils. Beaucoup soils are poorly drained, have a dark surface layer, and are silty clay loam throughout. They are in nearly level or depressional areas on bottom land. Tice and Lawson soils are somewhat poorly drained and have a dark surface layer. They are on the slightly higher parts of the bottom land along the major streams and tributaries. Haymond soils are well drained and are adjacent to streambanks and on the higher parts of the bottom land along the major streams.

Most areas of this association are used for soybeans, wheat, or corn. Some remain wooded. Improving drainage, controlling floods, and improving fertility are the main management concerns in cultivated areas. In areas where establishing a drainage system is difficult, pasture or wetland wildlife habitat are good alternative uses.

This association is generally unsuited to building site development and sanitary facilities because of the flooding.

7. Tice-Nameoki-Landes Association

Nearly level and gently sloping, somewhat poorly drained and well drained soils that are moderately permeable throughout, very slowly permeable in the upper part and moderately permeable in the lower part, or moderately rapidly permeable in the upper part and rapidly permeable in the lower part; formed in silty, clayey, loamy, and sandy alluvial sediment; on flood plains, natural levees, and low terraces

This association is on flood plains and natural levees along the Mississippi River. It is primarily east of a levee system that protects the soils against flooding by the Mississippi River. The part of the association west of the levee system is frequently flooded for long periods. Slopes range from 0 to 5 percent.

This association makes up about 8 percent of the county. It is about 25 percent Tice and similar soils, 20 percent Nameoki and similar soils, 10 percent Landes and similar soils, and 45 percent soils of minor extent.

The nearly level Tice soils formed in silty alluvium on bottom land. They are somewhat poorly drained and moderately permeable. Typically, the surface layer is very dark gray silt loam about 8 inches thick. The subsurface layer is very dark gray silty clay loam about 8 inches thick. The subsoil is about 36 inches thick. The upper part is very dark grayish brown, mottled silty clay loam. The lower part is grayish brown, mottled silt loam that has lenses of loam. The underlying material to a depth of 60 inches is mottled light brownish gray, yellowish brown, and light olive brown, stratified silt loam and very fine sandy loam.

The nearly level Nameoki soils formed in recent clayey sediment and in the underlying loamy alluvium. They are on flood plains and are somewhat poorly drained. They are very slowly permeable in the subsoil and moderately permeable in the underlying material. Typically, the surface layer is very dark gray silty clay about 11 inches thick. The subsoil is about 43 inches thick. The upper part is dark brown and brown, mottled silty clay. The lower part is grayish brown, mottled, stratified silt loam and very fine sandy loam. The underlying material to a depth of 60 inches is grayish brown, mottled, stratified silt loam and silty clay loam.

The nearly level and gently sloping Landes soils formed in loamy and sandy, stratified alluvium on natural levees on bottom land. They are well drained. They are moderately rapidly permeable in the subsoil and rapidly permeable in the underlying material. Typically, the surface layer is very dark grayish brown very fine sandy loam about 16 inches thick. The subsoil is brown very fine sandy loam about 17 inches thick. The underlying material to a depth of 60 inches is brown, mottled, stratified loamy very fine sand, very fine sandy loam, and silt loam.

Minor in this association are Beaucoup and Darwin soils; Orthents, loamy; and Urban land. Beaucoup and Darwin soils are poorly drained and are in swales and depressions on bottom land. Orthents, loamy, are well drained and moderately well drained. They have been extensively altered by cutting and filling and are in urban areas and on highway cloverleaf and levee embankments. Urban land consists of areas where buildings, streets, parking lots, and other structures have

so obscured the soils that identification of the soil series is not possible.

Most areas of this association are used for soybeans or wheat. Some are used for specialty crops, such as horseradish or vegetables. Improving drainage, controlling floods, and improving fertility are the main management concerns. Wind erosion and droughtiness are unique concerns in managing the more sandy soils.

Many protected areas on the east side of the levee system are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, permeability, and seepage are the main management concerns in areas used for urban development. Also, the areas are subject to rare flooding during periods when the levee system is under stress because of unusually heavy rainfall or snowmelt.

8. Darwin Association

Nearly level, poorly drained and very poorly drained soils that have a very slowly permeable subsoil; formed in clayey alluvial sediment on flood plains

This association is in broad areas on the flood plains along the Mississippi River. It is protected by a levee system against flooding by the Mississippi River. The native vegetation was dominantly mixed deciduous forest, sedges, and grasses. Slopes range from 0 to 2 percent.

This association makes up about 3 percent of the county. It is about 90 percent Darwin soils and 10 percent soils of minor extent.

Darwin soils are on flood plains and in depressions and back water marshes. Typically, the surface layer is very dark gray, mottled silty clay about 12 inches thick. The subsoil to a depth of 60 inches is mottled silty clay. The upper part is very dark gray and dark gray, and the lower part is gray.

Minor in this association are Ambraw soils; Aquents, clayey; and Tice soils. Ambraw soils are poorly drained, formed in loamy alluvium, and are on bottom land. Aquents, clayey, are poorly drained. They have been extensively altered by cutting and filling and are in urban areas. Tice soils are somewhat poorly drained, formed in silty alluvium, and are on bottom land.

Most areas of this association are used for soybeans. Improving surface drainage, maintaining tilth, controlling floods, and improving fertility are the main management concerns.

Some areas of this association are used as sites for buildings and sanitary facilities. The seasonal wetness, the shrink-swell potential, and permeability are the main management concerns in areas used for urban development. Also, the areas are subject to rare flooding during periods when the levee system is under stress because of unusually heavy rainfall or snowmelt.

9. Raddle-Haymond-Oakville Association

Nearly level to moderately sloping, well drained soils that have a moderately permeable or rapidly permeable subsoil; formed in silty and sandy alluvial sediment on foot slopes, flood plains, and terraces

This association is in areas adjoining the bluffs along the Mississippi River. Some of the lower parts of the landscape may be flooded during periods of unusually heavy rainfall or snowmelt. Slopes range from 0 to 10 percent.

This association makes up about 3 percent of the county. It is about 25 percent Raddle and similar soils, 20 percent Haymond and similar soils, 15 percent Oakville and similar soils, and 40 percent soils of minor extent.

The nearly level and gently sloping Raddle soils formed in silty alluvial sediment on terraces and foot slopes. They are moderately permeable in the subsoil. Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsurface layer is dark brown silt loam about 8 inches thick. The subsoil to a depth of 60 inches is silt loam. The upper part is yellowish brown, and the lower part is brown and mottled.

The nearly level Haymond soils formed in silty alluvial sediment on flood plains. They are moderately permeable in the subsoil. Typically, the surface layer is dark grayish brown silt loam about 14 inches thick. The underlying material extends to a depth of more than 60 inches. The upper part is dark brown and yellowish brown, friable silt loam, and the lower part is pale brown, very friable very fine sandy loam.

The gently sloping and moderately sloping Oakville soils formed in sandy alluvial sediment on terraces. They are rapidly permeable in the subsoil. Typically, the surface layer is dark brown fine sand about 11 inches thick. The subsoil is brown fine sand about 21 inches thick. The underlying material to a depth of 60 inches also is brown fine sand.

Minor in this association are Colp and Tice soils; Orthents, silty; Orthents, loamy; and a small acreage of Urban land. Colp soils are moderately well drained and formed in a thin layer of loess and the underlying lacustrine sediment. They are on terraces. Tice soils are somewhat poorly drained and formed in silty alluvium on bottom land. Orthents, loamy, and Orthents, silty, are well drained and moderately well drained. They have been extensively altered by cutting and filling and are in urban areas and on highway cloverleaf embankments. Urban land consists of areas where buildings, streets, parking lots, and other structures have so obscured the soils that identification of the soil series is not possible.

Most areas of this association are used for soybeans, corn, or wheat. Some are used for specialty crops, such as horseradish and vegetables. Improving fertility and controlling water erosion are the main management

concerns. Wind erosion and droughtiness are unique concerns in managing the sandy soils.

Many areas of this association are used as sites for buildings and sanitary facilities. Slope and seepage are the main management concerns in areas used for urban development. Also, flooding is a hazard on some of the lower parts of the landscape during periods of unusually heavy rainfall or snowmelt.

Broad Land Use Considerations

About two-thirds of the land in Madison County is used for farming. Cultivated crops, specialty crops, hay, and pasture are the main agricultural uses. About 10 percent of the acreage is wooded. Much of the woodland is not managed for commercial production. Nearly 15 percent of the acreage occurs as urban or suburban developments, which include towns and cities, highways, sites for industry, and subdivisions in unincorporated areas.

Soybeans, corn, and wheat are the principal cultivated crops. These crops are most extensive in associations 1, 2, and 3. These associations are moderately suited or well suited to cultivated crops. The major soils are adequately drained for the production of cultivated crops. Controlling erosion is a management consideration on the more sloping soils. Moisture stress and the availability of plant nutrients may be limitations on the soils that have a high content of sodium.

The principal cultivated crop in associations 6 and 8 is soybeans. Association 8 is usually too wet early in the spring to be cultivated and planted to corn. This association is moderately suited or well suited to cultivated crops. Very slow runoff often remains standing in swales or depressions for extended periods in areas of associations 6 and 7. As a result, crop production may be hampered. Levees provide protection against flooding of the Mississippi River in most areas of association 7 and in all areas of association 8. The major soils in these associations are well drained, poorly drained, or somewhat poorly drained. Providing an adequate drainage system is a concern in managing these soils.

Associations 7 and 9 are used not only for soybeans, wheat, and corn but also for specialty crops, such as sweet corn, horseradish, spinach, melons, and pumpkins (fig. 5). Generally, these associations are well suited or moderately well suited to cultivated crops and specialty crops in the areas protected by a levee system. The management considerations in these areas include improving fertility, providing adequate moisture, and controlling wind erosion. Most areas are sufficiently drained for crop production. Specialty crops, such as melons and pumpkins, grow well on the well drained, sandy soils in these associations. Irrigation may be necessary during dry periods. Areas outside the levee system generally are used for soybeans or woodland. These areas are only moderately suited to these uses because of the frequent flooding of the Mississippi River for long periods in the spring of most years. The flooding may delay planting or cause crop damage.

Hay and pasture plants are grown in all of the associations. Hayland and pasture provide good alternative uses in the more sloping areas of associations 4 and 5. These associations are well suited to moderately well suited to hay and pasture. Controlling water erosion is a major management consideration. A cover of hay provides limited protection against erosion on slopes that are more than 15 percent. A permanent cover of pasture plants also helps to control erosion in these areas. Planting with a no-till seeder reduces the susceptibility to erosion during periods when the grasses and legumes are becoming established.

Most of the woodland in the county is in associations 4, 5, and 6. Important species in areas of associations 4 and 5 are white oak, red oak, and shagbark hickory. Silver maple and green ash are in areas of association 6. Associations 4 and 5 are well suited to woodland in areas where slopes are less than 15 percent and moderately suited in areas where slopes are more than 15 percent. Excessive slope is a limitation when trees are planted and harvested. Erosion control is needed during tree planting. A good system of woodland management that includes protection from fire and grazing is needed.

Association 6 is the only association in the county that is not used for building site development and sanitary facilities. In urban areas dwellings are connected to sewage systems. In associations 7 and 8, a levee system protects many of the urban areas on the bottom land along the Mississippi River. These associations are poorly suited to dwellings and septic tank absorption fields because of the flooding, seasonal wetness, slow permeability, and a high shrink-swell potential. Generally, the levees reduce the flooding hazard. Flooding is still possible, however, during periods when the levee system is under stress because of unusually heavy rainfall or snowmelt. Associations 4 and 5 are well suited or moderately well suited to dwellings and septic tank absorption fields in areas where slopes are less than 15 percent. The slope, the shrink-swell potential, and the seasonal wetness are severe limitations in areas where slopes are more than 15 percent. Associations 1, 2, and 3 are poorly suited to dwellings and septic tank absorption fields because of seasonal wetness, slow permeability and a moderate or high shrink-swell potential. Association 9 is well suited to dwellings, but it is poorly suited to septic tank absorption fields because of seepage.

The potential for the development of wildlife habitat is good throughout the county. Associations 1, 2, 3, 7, and 9 are well suited to openland wildlife habitat. Associations 4 and 5 are well suited to woodland wildlife habitat. Management in areas of openland and woodland wildlife habitat includes establishing grassy and

Figure 5.—Spinach on the moderately well drained Landes Variant.

herbaceous cover for nesting, delaying mowing of cover areas until after August 1 of each year, retaining brushy areas, and planting hedgerows of conifers or shrubs. Associations 6, 7, and 8 are moderately suited to wetland wildlife habitat. Some of the swales and depressions in areas of these associations retain water for extended periods. These natural wetlands can be preserved or improved as habitat for wetland wildlife. Ditches, pits, and dikes can be constructed to retain more water. Planting wildlife food, such as millet, buckwheat, smartweed, and soybeans, attract waterfowl. One large area of wetland wildlife habitat is near Horseshoe Lake. The Mississippi River and its islands also attract wetland wildlife.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Fayette silt loam, 2 to 5 percent slopes, is one of several phases in the Fayette series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Fayette-Hickory complex, 15 to 30 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Dumps is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

7D3—Atlas silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, somewhat poorly drained soil is on side slopes along drainageways. Individual areas are irregular in shape and are 5 to 25 acres in size.

Typically, the surface layer consists mostly of subsoil material. It is brown, firm silty clay loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is pale brown, mottled, very firm silty clay. The next part is light brownish gray, mottled, very firm silty clay and clay. The lower part is light brownish gray, mottled, very firm and firm clay loam. In some areas the upper part of the subsoil contains less clay and sand. In other areas, the entire subsoil contains less clay and sand.

Included with this soil in mapping are small areas of the well drained Hickory soils and the somewhat poorly drained Grantfork and Marine soils. Hickory soils are on side slopes downstream from the Atlas soil. Grantfork soils have a high concentration of sodium in the subsoil. They are on side slopes above the Atlas soil. Marine soils are on convex ridgetops. Their increase in clay content from the surface layer to the subsoil is greater than that of the Atlas soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Atlas soil at a very slow rate. Surface runoff is rapid. A perched seasonal high water table is within a depth of 2 feet from April through June in most years. Seepy spots are common. Available water capacity is moderate. Organic matter

content is low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is strongly acid to neutral. It has a high shrink-swell potential. The potential for frost action is high. The surface layer is firm when moist and hard and cloddy when dry.

Most areas are cultivated. This soil is unsuited to cultivated crops because of a severe erosion hazard. It is moderately suited to hay, pasture, and woodland. It is poorly suited to dwellings and septic tank absorption fields.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Extending the footings in the fill areas into the undisturbed soil and diverting runoff from upslope areas also help to prevent this damage. Installing subsurface drains within the backfill material at the base of the foundation helps to lower the water table. Compacting the fill improves stability.

The seasonal wetness and the very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is VIe.

8E3—Hickory clay loam, 12 to 20 percent slopes, severely eroded. This moderately steep, well drained soil is on side slopes. Individual areas are long and irregular in shape and are 5 to 40 acres in size.

Typically, the surface layer consists mostly of subsoil material. It is brown, friable clay loam about 8 inches thick. The subsoil to a depth of 60 inches is clay loam. The upper part is dark yellowish brown and firm. The next part is strong brown and yellowish brown, mottled, and very firm. The lower part is grayish brown, mottled, and firm. In some areas the soil is silty clay loam to a depth of 60 inches. In other areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on narrow bottom land. Also included are the somewhat poorly drained Atlas soils on side slopes upstream from the Hickory soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil ranges from very strongly acid in the upper part to neutral in the lower part. The shrink-swell potential is moderate in the subsoil. The potential for frost action is moderate.

Most areas are used for cultivated crops or hay. This soil is unsuited to cultivated crops because of a severe erosion hazard. It is moderately suited to pasture and woodland. It is poorly suited to dwellings and septic tank absorption fields.

A permanent cover of pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Competing vegetation can be controlled by chemicals.

This soil is poorly suited to dwellings because of the slope. Altering the site by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Footings in fill areas should be extended into the undisturbed soil. Diverting runoff from the higher areas helps to prevent structural damage.

This soil is poorly suited to septic tank absorption fields because of the slope. Effluent may seep laterally and surface at the lower part of the slope. Installing the filter lines on the contour helps to overcome the slope.

The land capability classification is VIe.

8F—Hickory silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes. Individual areas are long and narrow or irregular in shape and are 10 to 55 acres in size.

Typically, the surface layer is very dark grayish brown, very friable silt loam about 5 inches thick. The subsurface layer is yellowish brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark yellowish brown, mottled, friable loam. The lower part is yellowish brown, mottled, firm and friable clay loam. In some areas the soil contains more sand and gravel. In other areas the subsoil contains more clay. In some places the soil contains less sand. In other places, the subsoil is thinner and the calcareous underlying material is within a depth of 36 inches. In some areas, dominantly on north- and east-facing slopes, the slope is more than 30 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on bottom land. Also included are areas of the somewhat poorly drained Atlas soils on side slopes upstream from the Hickory soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Hickory soil at a moderate rate. Surface runoff is very rapid. Available water capacity is high. Organic matter content is moderately low. The surface layer is commonly medium acid. The subsoil is very strongly acid or strongly acid. It has a moderate shrink-swell potential. The potential for frost action is moderate.

Most areas are used as woodland (fig. 6). Others are used for pasture. This soil is moderately suited to woodland. It is well suited to pasture. It is generally unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the steep slope.

A permanent cover of pasture plants helps to control water erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare soils, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Competing vegetation can be controlled by chemicals.

The land capability classification is VIe.

16—Rushville silt loam. This nearly level, poorly drained soil is on broad upland plains and in upland depressions. It is ponded for brief periods in the spring. Individual areas are oval or irregular in shape and range from 3 to 250 acres in size.

Typically, the surface layer is dark grayish brown, very friable silt loam about 8 inches thick. The subsurface layer is grayish brown and light brownish gray, mottled, very friable silt loam about 12 inches thick. The subsoil extends to a depth of 60 inches. The upper part is light brownish gray, mottled, very firm silty clay. The next part is light brownish gray, mottled, very firm silty clay loam. The lower part is light olive gray, mottled, firm silty clay loam. In some areas the surface layer is darker.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt soils, which have a high content of sodium in the subsoil and are on the slightly higher knolls and ridges. Also included are the poorly drained Huey soils and the somewhat poorly drained Marine soils. Huey soils have a high content of sodium in the subsoil. They occur as areas intricately mixed with areas of the Rushville soil. Marine soils are on slight rises and are not subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Rushville soil at a very slow rate. Surface runoff is very slow or ponded. A perched seasonal high water table is 1 foot above the surface to 1 foot below from March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil ranges from strongly acid in the upper part to slightly acid in the lower part. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or wheat. This soil is moderately suited to cultivated crops, hay, and pasture. It is poorly suited to dwellings and septic tank absorption fields. It is well suited to sewage lagoons.

In the areas used for soybeans, corn, and small grain, the wetness is a limitation. It can be reduced by a combination of narrowly spaced subsurface drains and surface inlets or of shallow ditches and outlets. A system of conservation tillage that returns crop residue to the soil improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

If this soil is used for hay or pasture, the wetness is a limitation. Good pasture and hayland management improves the quality and quantity of the forage and

Figure 6.—An area of Hickory silt loam, 15 to 30 percent slopes, used as woodland.

keeps the soil in good condition. Good pasture and hayland management includes a drainage system, applications of fetilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The ponding and the very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

19D3—Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, well drained soil is on side slopes near the head of

drainageways. Individual areas are irregular in shape and are 5 to 20 acres in size.

Typically, the surface layer consists mostly of subsoil material. It is brown, firm silty clay loam about 7 inches thick. The subsoil is about 20 inches thick. The upper part is dark yellowish brown, firm silty clay loam and silt loam. The lower part is brown, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, friable, calcareous silt loam. In some areas the calcareous underlying material is at or near the surface. In other areas the subsoil extends below a depth of 35 inches. In places a seasonal high water table is 4 to 6 feet below the surface during the spring.

Included with this soil in mapping are small areas of the gently sloping Raddle soils on foot slopes and the somewhat poorly drained Wakeland soils on narrow bottom land. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Sylvan soil at a moderate rate. Surface runoff is rapid. Available water capacity is very high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is medium acid to neutral. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for cultivated crops, hay, and pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is very poorly suited to cultivated crops. It is moderately suited to dwellings and septic tank absorption fields. It is well suited to hay and pasture.

Erosion is a hazard in the areas used for cultivated crops. It can be controlled by a conservation cropping system that is dominated by meadow or small grain crops, a system of conservation tillage that leaves crop residue on the surface after planting, or contour farming. Crop residue management and additions of other organic material increase the rate of water infiltration and improve tilth.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The shrink-swell potential and the slope are limitations on sites for dwellings. Altering the site by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Extending the footings in the fill areas into the undisturbed soil and diverting runoff from the higher areas also help to prevent this damage.

The slope is a limitation on sites for septic tank absorption fields. Installing a series of absorption trenches on the contour helps to overcome this limitation. Separate filling of the individual trenches can be achieved by using a distribution box or by installing a serial distribution system.

The land capability classification is IVe.

35F—Bold silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes in highly dissected areas on the bluffs along the Mississippi River. Individual areas are irregular in shape and are 3 to 25 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 5 inches thick. The next layer is brown, friable silt loam about 5 inches thick. The underlying material to a depth of 60 inches is grayish brown and brown, very friable, calcareous silt loam. In some areas the soil has a silty clay loam subsoil and is not calcareous within a depth of 40 inches. In other areas, dominantly on north- or east-facing slopes, the slope is more than 30 percent.

Included with this soil in mapping are small areas of the well drained Raddle and Worthen soils on foot slopes and the somewhat poorly drained Wakeland soils on narrow bottom land. Also included are areas of limestone escarpments and areas of colluvial debris at the base of the slopes below the escarpments. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Bold soil at a moderate rate. Surface runoff is very rapid. Available water capacity is very high. Organic matter content is moderately low. The surface layer commonly is mildly alkaline. Reaction below the surface layer is moderately alkaline. The potential for frost action is high.

Most areas are idle. Some are used for hay and pasture. This soil is moderately suited to pasture and very poorly suited to woodland. It is generally unsuited to cultivated crops and to dwellings and septic tank absorption fields because of the steep slope.

A permanent cover of pasture plants helps to control water erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

The land capability classification is VIe.

37A—Worthen silt loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil is on foot slopes and terraces adjacent to the bottom land along the Mississippi River. Individual areas are irregular in shape and are 20 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam about 10 inches thick. The subsoil is friable silt loam about 28 inches thick. The upper part is dark brown, and the lower part is brown and mottled. The underlying material to a depth of 60 inches is dark yellowish brown, mottled, friable silt loam. In some areas the surface layer and subsurface layer are thinner or lighter in color. In other areas the surface layer, subsurface layer, and subsoil contain more sand. In places light colored silt loam overwash covers the dark surface soil.

Included with this soil in mapping are small areas of the somewhat poorly drained Dupo, Orion, and Tice soils on bottom land. These soils are subject to flooding. They make up 10 to 15 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 4 to 6 feet below the surface from March through June in most years. The surface layer is neutral. The subsoil is neutral or slightly acid. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans, wheat, corn, or horseradish. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and dwellings without basements. It is moderately suited to dwellings with basements and to septic tank absorption fields.

In the areas used for crops, crop residue management and regular additions of other organic material increase the rate of water infiltration and improve tilth.

In the areas used as sites for dwellings with basements, the seasonal high water table is a limitation. It can be lowered, however, by installing tile lines around the base of the foundation.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Subsurface drains help to lower the water table. Enlarging the absorption field helps to overcome the moderate permeability.

The land capability classification is I.

37B—Worthen silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on foot slopes and alluvial fans adjacent to the bluffs along the Mississippi River. Individual areas are irregular in shape and are 20 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 8 inches thick. The subsoil is friable silt loam about 24 inches thick. The upper part is dark brown, and the lower part is brown. The underlying material to a depth of 60 inches is dark yellowish brown, friable silt loam. In some areas the surface layer and subsurface layer are thinner or lighter in color. In other areas a dark buried soil is below the subsoil.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion and Tice soils on bottom land. These soils make up 5 to 10 percent of the unit.

Water and air move through the Worthen soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is high. The surface layer is mildly alkaline. The subsoil is slightly acid or neutral. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans, wheat, corn, or horseradish. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops, dwellings, and septic tank absorption fields.

Erosion is a hazard in the areas used for crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming. Crop residue management and regular additions of other organic material increase the rate of water infiltration and improve tilth. In some areas conservation practices are needed on the soils upslope to control runoff and siltation on this soil.

The land capability classification is IIe.

41B—Muscatine silt loam, 1 to 4 percent slopes. This gently sloping, somewhat poorly drained soil is on low upland ridges and knolls. Individual areas are oblong or irregular in shape and are 3 to 120 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer also is very dark grayish brown, friable silt loam. It is about 7 inches thick. The subsoil is mottled, friable silty clay loam about 34 inches thick. The upper part is dark grayish brown, the next part is grayish brown, and the lower part is light brownish gray. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the surface layer is thinner or lighter in color. In other areas the subsoil contains more clay. In some places the subsurface layer is light colored silt loam. In other places a seasonal high water table is more than 4 feet below the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt soils, which have a high content of sodium in the subsoil and are on the lower parts of the ridges. Also included are the poorly drained Sable soils in swales. These soils are subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Muscatine soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 2 to 4 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content also is high. The

surface layer commonly is neutral because of local liming practices. The subsoil is slightly acid to mildly alkaline. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is moderately suited to dwellings without basements. It is poorly suited to dwellings with basements and to septic tank absorption fields.

Erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, or terraces. Crop residue management and regular additions of other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness is a severe limitation on sites for dwellings with basements. The shrink-swell potential and the seasonal wetness are limitations on sites for dwellings without basements. Installing subsurface drains around the foundation helps to lower the water table. Reinforcing footings and foundations helps to prevent structural damage caused by shrinking and swelling.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. It can be overcome by installing a sealed, buried or recirculating sand filter and a disinfection tank. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIe.

46A—Herrick silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on broad, loess-covered till plains. Individual areas are irregular in shape and are 10 to 120 acres in size.

Typically, the surface layer is very dark gray and very dark grayish brown, friable silt loam about 11 inches thick. The subsurface layer is dark grayish brown and very dark grayish brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark grayish brown and gray, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, firm silty clay loam and silt loam. In some areas the surface layer is thinner or lighter in color. In other areas the subsoil contains less clay. In some places a seasonal high water table is more than 3 feet below the surface. In other places the soil does not have a light colored subsurface layer.

Included with this soil in mapping are small areas of the poorly drained Piasa soils in slight depressions. These soils have a high content of sodium in the subsoil. Also included are the poorly drained Virden soils in swales. These soils are subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Herrick soil at a moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content also is high. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is slightly acid to strongly acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

Erosion is the main hazard in the areas used for corn, soybeans, and small grain. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, or terraces. Crop residue management and regular additions of other organic material increase the rate of water infiltration and improve tilth. In areas where wetness is a limitation, installing random subsurface drains and surface inlets improves drainage. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by the shrinking and swelling. Backfilling around the footings and foundations with sand and gravel also helps to prevent this damage. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by installing a sealed, buried or recirculating sand filter and a disinfection tank. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIw.

50—Virden silty clay loam. This nearly level, poorly drained soil is in low areas on interstream divides and on broad upland plains. It is ponded for brief periods in the spring. Individual areas are irregular in shape or oval and are 10 to 140 acres in size.

Typically, the surface layer is black, friable silty clay loam about 9 inches thick. The subsurface layer is black, mottled, firm silty clay loam about 6 inches thick. The subsoil is mottled, firm silty clay loam about 40 inches thick. The upper part is black, and the lower part is grayish brown. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In some areas the subsurface layer is lighter in color. In other areas the subsoil contains less clay. In places the surface layer is thicker.

Included with this soil in mapping are small areas of the moderately well drained Downs and Harrison soils on convex ridges and the poorly drained Piasa soils, which have a high content of sodium. Also included are the somewhat poorly drained Herrick soils on slight rises. These soils are not subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Virden soil at a moderately slow rate. Surface runoff is slow to ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through June in most years. Available water capacity is high. Organic matter content also is high. Reaction in the surface layer is neutral. The subsoil is slightly acid or neutral. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of soybeans, corn, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. A combination of random subsurface drains and inlets or of shallow ditches and outlets improves drainage. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and fertility. Tilling when the soil is wet causes surface compaction.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of dwellings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The ponding and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. A sealed, buried or recirculating sand filter and a disinfection tank help to overcome the moderately slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIw.

53B—Bloomfield loamy fine sand, 1 to 3 percent slopes. This gently sloping, well drained soil is on terraces adjacent to the bottom land along the Mississippi River. Individual areas are long and irregular in shape and are 10 to 500 acres in size.

Typically, the surface layer is brown, very friable loamy fine sand about 7 inches thick. The subsurface layer is about 28 inches of brown, very friable loamy fine sand and dark yellowish brown and yellowish brown, loose fine sand. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, loose fine sand that has thin bands of dark brown, very friable loamy fine sand. The lower part is dark brown, very friable fine sandy loam that has thin bands of yellowish brown, loose fine sand. In some areas the subsoil is fine sand and does not have dark brown bands. In other areas the surface layer is darker. In some places the subsoil contains more clay. In other places it is stratified with silt loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Ridgeville soils on the slightly lower parts of the landscape and the moderately well drained St. Charles soils. St. Charles soils contain more clay in the subsoil than the Bloomfield soil and have a high available water capacity. Their positions on the landscape are similar to those of the Bloomfield soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Bloomfield soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is slightly acid.

Most areas are used for soybeans, wheat, or specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is moderately suited to cultivated crops and specialty crops if it is irrigated and poorly suited if it is not irrigated. It is well suited to dwellings and poorly suited to septic tank absorption fields. It is moderately suited to evergreen trees.

Droughtiness, wind erosion, and low fertility are limitations in the areas used for cultivated crops or specialty crops. Returning crop residue to the soil and regularly adding other organic material improve fertility and conserve moisture. Irrigation helps to overcome the drought hazard. Properly managing crop residue and maintaining properly spaced buffer areas of wheat or rye during the spring help to control wind erosion.

If this soil is used as woodland, protection from fire and grazing is essential. The seedling mortality rate can be reduced by planting drought-tolerant species and by mulching, which helps to conserve moisture. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

Because of the rapid permeability, ground water pollution is a hazard if this soil is used as a site for standard septic tank absorption fields. A sealed sand filter and a disinfection tank help to prevent this pollution.

The land capability classification is IIIs.

61B—Atterberry silt loam, 1 to 4 percent slopes. This gently sloping, somewhat poorly drained soil is on low upland ridges and knolls. Individual areas are irregular in shape and are 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface

layer is dark grayish brown and grayish brown, friable silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, friable silt loam. In some areas a seasonal high water table is more than 3 feet below the surface during the spring. In other areas the surface layer is thinner or lighter in color. In some places the subsoil contains more clay. In other places the subsurface layer is darker.

Included with this soil in mapping are small areas of the poorly drained Sable and Virden soils in the lower swales. These soils are subject to ponding. They make up 5 to 10 percent of the unit.

Water and air move through the Atterberry soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface during the period March through June in most years. Available water capacity is very high. Organic matter content is moderate. Reaction in the surface layer is neutral because of past liming practices. The subsoil is medium acid in the upper part and slightly acid in the lower part. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a problem, random subsurface drains and surface inlets improve drainage. Erosion is a hazard. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, or terraces. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction, excessive runoff, and erosion.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. It can be overcome by a sealed, buried or recirculating sand filter and a disinfection tank. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIe.

68—Sable silty clay loam. This nearly level, poorly drained soil is in low areas on broad upland plains. It is ponded for brief periods in the spring. Individual areas are irregular in shape and are 10 to 200 acres in size.

Typically, the surface layer is black, friable silty clay loam about 10 inches thick. The subsurface layer is very dark gray, firm silty clay loam about 6 inches thick. The subsoil is mottled silty clay loam about 31 inches thick. The upper part is dark gray, grayish brown, and light brownish gray and is firm. The lower part is grayish brown and friable. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In some areas a seasonal high water table is more than 2 feet below the surface. In other areas the subsoil has more clay. In some places the subsurface layer is silt loam and is lighter in color. In other places the surface layer is thicker.

Included with this soil in mapping are small areas of the somewhat poorly drained Atterberry soils on slight rises. These soils are not subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Sable soil at a moderate rate. Surface runoff is slow to ponded. A seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is very high. Organic matter content is high. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is neutral to mildly alkaline. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of soybeans, corn, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. A combination of random subsurface drains and surface inlets or of shallow ditches and outlets improves drainage. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and fertility. Tilling when the soil is wet causes surface compaction.

The ponding is a severe hazard on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations for dwellings without basements above the seasonal high water table by adding fill material also helps to overcome the wetness.

The ponding and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. A sealed, buried or recirculating sand filter and a disinfection tank help to overcome the moderately slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIw.

70—Beaucoup silty clay loam. This nearly level, poorly drained soil is on flood plains along the major

streams. It is subject to ponding. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow and are 10 to 200 acres in size.

Typically, the surface soil is black, firm silty clay loam about 12 inches thick. The subsoil is mottled, firm silty clay loam about 33 inches thick. The upper part is dark gray, the next part is grayish brown, and the lower part is gray. The underlying material to a depth of 60 inches is gray, mottled, firm silty clay loam. In some areas the surface layer and subsoil are silty clay or clay. In other areas the surface soil is thinner and lighter in color. In some places a seasonal high water table is more than 2 feet below the surface. In other places, the underlying material is sand or loamy sand. In some areas the upper part of the soil is stratified silt loam and silty clay loam.

Included with this soil in mapping are small areas of soils that are frequently flooded for brief periods. These soils are along the narrower stream bottoms. They make up 10 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is slow to ponded. A seasonal high water table ranges from 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is very high. Organic matter content is high. Reaction in the surface layer is neutral because of local liming practices. The subsoil is neutral or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for cultivated crops. Some small areas are wooded. Some areas are used as sites for urban development. This soil is well suited to cultivated crops and woodland. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of the crops commonly grown in the county. The drainage system should be maintained, and in some areas additional drainage measures are needed. After heavy rainfall, water often remains standing in swales or depressional areas for extended periods. This water may hamper crop production. Where wetness is a limitation, surface ditches or a combination of subsurface drains and outlets improves drainage. Returning crop residue to the soil helps to maintain good tilth and improves water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The ponding and the flooding are hazards on sites for dwellings. Raising the site above the surrounding ground level by adding fill material helps to divert surface water. If outlets are available, installing subsurface drains around foundations reduces the wetness. The extensive system of levees helps to protect the soil against flooding.

The ponding and the moderately slow permeability are limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a sealed sand filter and a disinfection tank.

The land capability classification is IIw.

71—Darwin silty clay. This nearly level, poorly drained soil is on flood plains. It is subject to ponding. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow or irregular in shape and are 10 to 2,000 acres in size.

Typically, the surface layer is very dark gray, mottled, very firm silty clay about 12 inches thick. The subsoil to a depth of 60 inches is mottled, very firm silty clay. The upper part is very dark gray and dark gray, and the lower part is gray. In some areas the subsoil is silty clay loam. In other areas the lower part of the subsoil and underlying material are fine sandy loam to fine sand. In some places the surface layer is thinner and lighter in color. In other places the soil has a dark surface layer more than 20 inches thick.

Included with this soil in mapping are small areas of the somewhat poorly drained Tice soils, which formed in silty alluvium on the slightly higher parts of the flood plains. These soils are not subject to ponding. Also included, near drainageways, are a few small areas where local flooding occasionally occurs. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Darwin soil at a very slow rate. Surface runoff is slow to ponded. A seasonal high water table ranges from 1 foot above the surface to 2 feet below from March through June in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer and subsoil is neutral. The surface layer is very firm when moist and hard and cloddy when dry. The shrink-swell potential is very high in the subsoil. The potential for frost action is moderate.

Most areas are used for soybeans or wheat. Many are used as sites for urban development. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings. It is well suited to sewage lagoons, but it is generally unsuited to septic tank absorption fields because of the ponding and the very slow permeability.

This soil is sufficiently drained for the production of cultivated crops. The drainage system should be maintained, and in some areas additional drainage

measures are needed. After heavy rainfall, water often remains standing in swales or depressional areas for extended periods. This water may hamper crop production. Installing surface ditches closely spaced in areas where drainage outlets are available improves drainage. Improving drainage and applying a system of conservation tillage that adds organic material to the soil improve tilth and increase the rate of water infiltration.

The flooding, the ponding, and the high shrink-swell potential are severe limitations on sites for dwellings. Raising the site above the surrounding ground level by adding fill material helps to divert surface water. Backfilling around foundations with sand and gravel, installing subsurface drains, and reinforcing footings help to prevent the damage caused by shrinking and swelling and by wetness. The extensive system of levees helps to protect the soil against flooding.

The land capability classification is IIIw.

78—Arenzville silt loam. This nearly level, well drained soil is on flood plains along tributaries that drain nearby uplands. It is occasionally flooded for brief periods from March through June. Individual areas are irregular in shape and are 10 to 70 acres in size.

Typically, the surface layer is dark brown, friable and very friable silt loam about 9 inches thick. The underlying material to a depth of 60 inches is silt loam. The upper part is stratified brown and dark grayish brown and is friable and very friable. The next part is stratified dark grayish brown, brown, and very dark grayish brown and is very friable. The lower part, a buried soil, is very dark gray and very dark grayish brown and is friable. In some areas the lower part of the underlying material is lighter in color. In other areas the surface layer is darker. In places the surface layer and the underlying material contain more sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Orion and Dupo soils in the lower swales on the flood plains. These soils make up 10 to 15 percent of the unit.

Water and air move through the Arenzville soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer is neutral. The underlying material is neutral or mildly alkaline. The shrink-swell potential is moderate in the lower part of the soil. The potential for frost action is high.

Most areas are used for soybeans, corn, or horseradish. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

The flooding normally does not interfere with the growth of soybeans, corn, or horseradish. A system of conservation tillage that leaves crop residue on the surface after planting and additions of other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The land capability classification is IIw.

102A—La Hogue loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on terraces. Individual areas are long and irregular in shape and are 10 to 40 acres in size.

Typically, the surface soil is very dark grayish brown, friable loam about 12 inches thick. The subsoil is about 28 inches thick. The upper part is very dark grayish brown and dark grayish brown, mottled, firm clay loam. The next part is dark grayish brown, mottled, firm sandy clay loam. The lower part is brown, mottled, friable fine sandy loam. The underlying material to a depth of 60 inches is strong brown, mottled, loose loamy fine sand. In some areas the subsoil has less clay and more sand. In other areas it has more silt and clay.

Included with this soil in mapping are small areas of the well drained Onarga soils on the higher parts of the terraces and the poorly drained Ambraw soils on bottom land that is subject to flooding. Also included, on the lower parts of the terraces, are a few small areas of soils that are subject to rare flooding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the subsoil of the La Hogue soil at a moderate rate and through the underlying material at a moderately rapid rate. A seasonal high water table is 1 to 3 feet below the surface during the period March through June. Surface runoff is slow. Available water capacity is moderate. Organic matter content also is moderate. The surface layer is mildly alkaline because of local liming practices. The subsoil is medium acid or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, wheat, or specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is well suited to cultivated crops and specialty crops. It is poorly suited to dwellings and septic tank absorption fields.

A drainage system may be needed to improve productivity in the areas used for cultivated crops or specialty crops. Subsurface drains function satisfactorily if suitable drainage outlets are available. Minimizing tillage and either returning crop residue to the soil or regularly adding other organic material help to maintain fertility and tilth. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The seasonal high water table is a limitation on sites for dwellings. It can be lowered by installing subsurface drains around the footings. Diverting surface water and raising the foundation of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The seasonal high water table is a limitation on sites for septic tank absorption fields. It can be lowered by subsurface drains. Raising the absorption field by adding fill material also helps to overcome the wetness.

The land capability classification is I.

113B—Oconee silt loam, 1 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on upland knolls and broad ridges. Individual areas are oval or irregular in shape and are 5 to 70 acres in size.

Typically, the surface layer is very dark grayish brown, very friable silt loam about 8 inches thick. The subsurface layer is dark grayish brown and grayish brown, very friable and friable silt loam about 8 inches thick. The subsoil is about 42 inches thick. The upper part is brown, mottled, firm silty clay loam. The next part is brown and grayish brown, mottled, very firm silty clay. The lower part is brownish gray and light brownish gray, mottled, firm silty clay loam. The underlying material to a depth of 60 inches is brown, mottled, friable silt loam. In some areas the surface layer is lighter in color. In other areas the subsoil contains less clay. In places a seasonal high water table is within 1 foot of the surface. In severely eroded areas, the surface layer is thinner and contains more clay.

Included with this soil in mapping are small areas of the poorly drained, nearly level Piasa and somewhat poorly drained, gently sloping Darmstadt soils on ridges. These soils have a high content of sodium in the subsoil. They make up 10 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is strongly acid or medium acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a limitation, a combination of random subsurface drains and surface inlets improves drainage. Erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting or by contour farming. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal high water table and the high shrink-swell potential are severe limitations on sites for dwellings. Reinforcing footings and foundations and backfilling around the footings and foundations with sand and gravel help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal high water table and the slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIe.

119C3—Elco silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, moderately well drained soil is on upland side slopes. Individual areas are irregular in shape and are 10 to 45 acres in size.

Typically, the surface layer consists primarily of subsoil material. It is dark brown, firm silty clay loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown and dark yellowish brown, mottled, firm silty clay loam. The lower part is pale brown and light brownish gray, mottled, firm clay loam. In some areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil and are on side slopes. Also included are the somewhat poorly drained Atlas soils, which are very slowly permeable in the subsoil and are on the lower side slopes. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is medium. A perched seasonal high water table is 2.5 to 4.5 feet below the surface from March through May in most years. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is medium acid to neutral. It has a moderate shrink-swell potential. The potential for frost action is high. Tilth is poor.

Most areas are used for cultivated crops, hay, or pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to hay and pasture and is poorly suited to cultivated crops, dwellings, and septic tank absorption fields.

Erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation dominated by meadow or small grain crops. Returning crop residue to the soil and regularly adding other organic material

increase the rate of water infiltration and improve tilth. Hillside seeps are common. Because of these seeps, the soil dries out slowly in the spring. Tile drains help to overcome this limitation.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations and backfilling around the footings and foundations with sand and gravel help to prevent the structural damage caused by shrinking and swelling. Diverting runoff from the higher areas also helps to prevent this damage. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderately slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IVe.

119D2—Elco silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, moderately well drained soil is on upland side slopes. Individual areas are long and narrow or irregular in shape and are 5 to 30 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 2 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silty clay loam. The next part is grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm clay loam. In some areas, the soil formed entirely in loess and the lower part of the subsoil is firm silty clay loam. In other areas the lower part of the subsoil contains more sand and clay. In places the soil is more sloping.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland, Grantfork, and Atlas soils. Wakeland soils formed in silty alluvium on bottom land. Grantfork soils have a high content of sodium in the subsoil. They are on side slopes. Atlas soils have a very slowly permeable subsoil. They are on the lower side slopes. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. A perched seasonal high water table is 2.5 to 4.5 feet below the surface from March through May in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is strongly acid or very strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for cultivated crops, hay, or pasture. Some small areas are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and to hay and pasture and is well suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

Erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation that includes 1 year or more of meadow or small grain crops. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Hillside seeps are common. Because of these seeps, the soil dries out slowly in the spring. Tile drains help to overcome this limitation.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The seasonal wetness, the shrink-swell potential, and the slope are limitations on sites for dwellings. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the structural damage caused by shrinking and swelling. Diverting runoff from the higher areas also helps to prevent this damage. Installing subsurface drains around the foundation helps to lower the water table. Constructing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Footings in fill areas should extend into the undisturbed soil.

The seasonal wetness and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderately slow permeability. Subsurface drains help to lower the water table.

The land capability classification is IIIe.

119D3—Elco silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, moderately well drained soil is on upland side slopes. Individual areas are long and narrow and are 10 to 40 acres in size.

Typically, the surface layer consists mainly of subsoil material. It is dark brown, firm silty clay loam about 6 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silty clay loam. The next part is light brownish gray, firm clay loam. The lower part is light gray, mottled, firm clay loam. In some areas, the soil formed entirely in loess and the subsoil is silty clay loam throughout. In other areas the subsoil contains more clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil and are on side slopes. Also included are the somewhat poorly drained Atlas soils, which have a very slowly permeable subsoil and are on the lower side slopes. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Elco soil at a moderate rate and through the lower part at a moderately slow rate. Surface runoff is rapid. A perched seasonal high water table is at a depth of 2.5 to 4.5 feet during the period March through May in most years. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is neutral to very strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for cultivated crops, hay, or pasture (fig. 7). This soil is very poorly suited to cultivated crops. It is moderately suited to hay and pasture and well suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

Figure 7.—A pastured area of Elco silty clay loam, 10 to 15 percent slopes, severely eroded.

Erosion is a hazard in the areas used for cultivated crops. It can be controlled by a conservation cropping system that is dominated by meadow or small grain crops, by a system of conservation tillage that leaves crop residue on the surface after planting, and by contour farming. Properly managing crop residue and adding other organic material to the soil increase the rate of water infiltration and improve tilth. Hillside seeps are common. Because of these seeps, the soil dries out slowly in the spring. Tile drains help to overcome this limitation.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The seasonal wetness, the shrink-swell potential, and the slope are limitations on sites for dwellings. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the structural damage caused by shrinking and swelling. Diverting runoff from the higher areas also helps to prevent this damage. Installing subsurface drains around the foundation helps to lower the water table. Constructing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Footings in fill areas should extend into the undisturbed soil.

The seasonal wetness and the moderately slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption field or installing a buried or recirculating sand filter helps to overcome the moderately slow permeability. Subsurface drains help to lower the water table.

The land capability classification is IVe.

120—Huey silt loam. This nearly level, poorly drained soil is on broad, loess-covered till plains. It is subject to ponding. Individual areas are oval or irregular in shape and are 3 to 70 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 7 inches thick. The subsurface layer is brown, friable silty clay loam about 2 inches thick. The subsoil is light brownish gray, mottled silty clay loam about 28 inches thick. It has a high content of sodium. The upper part is firm, and the lower part is friable. The underlying material to a depth of 60 inches is light gray and light brownish gray, friable silt loam. In some areas the subsoil contains more clay. In other areas a seasonal high water table is more than 2 feet below the surface. In some places the surface layer is darker. In some eroded areas it is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Oconee and poorly drained Rushville and Cowden soils. These soils do not have a high content of sodium in the subsoil. Oconee soils are on slight rises, and Rushville and Cowden soils are on upland flats and depressions. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Huey soil at a very slow rate. Surface runoff is very slow. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through June in most years. Available water capacity is moderate. Organic matter content is moderately low. The surface layer is mildly alkaline. The subsoil is moderately alkaline. It has a moderate shrink-swell potential. The surface layer is sticky when wet and hard when dry. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is poorly suited to cultivated crops and moderately suited to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields.

The ponding and the high content of sodium in the subsoil are limitations in the areas used for cultivated crops. A combination of narrowly spaced subsurface drains and surface inlets or of shallow ditches and outlets improve drainage. The high content of sodium limits the availability and uptake of some plant nutrients, causes moisture stress during dry periods, and may cause siltation in tile lines. A system of conservation tillage that leaves crop residue on the surface after planting improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods and decreases the rate of water infiltration.

If this soil is used for hay and pasture, the ponding and the high content of sodium in the subsoil are limitations. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes a drainage system, applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding is a hazard on sites for dwellings. Diverting surface water and raising the foundation of dwellings without basements above the seasonal high water table by adding fill material reduce this hazard.

The ponding and the very slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a recirculating sand filter and a disinfection tank.

The land capability classification is IVw.

122B—Colp silt loam, 1 to 4 percent slopes. This gently sloping, moderately well drained soil is on stream

terraces adjacent to the bottom land along the Mississippi River. Individual areas are irregular in shape and are 5 to 50 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsurface layer is yellowish brown, friable silt loam about 4 inches thick. The subsoil is about 27 inches thick. The upper part is brown, firm silty clay loam. The next part is strong brown, mottled, very firm silty clay. The lower part is strong brown, mottled, very firm silty clay loam. The underlying material to a depth of 60 inches is reddish brown and brown, mottled, very firm and firm, stratified silty clay loam and silt loam. In some areas the subsoil contains less clay. In other areas a seasonal high water table is within 2 feet of the surface. In some places the lower part of the subsoil and the underlying material are sandy loam to fine sand. In other places the soil is deeper to silty clay.

Included with this soil in mapping are small areas of the well drained Bloomfield soils, which formed in sandy sediment and have a low available water capacity. These soils are on terraces. They make up 10 to 15 percent of the unit.

Water and air move through the Colp soil at a slow rate. Surface runoff is medium. A seasonal high water table is 2 to 4 feet below the surface during the period March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is very strongly acid or strongly acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, small grain, or corn. Many are used as sites for dwellings. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

Erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming. Adding organic material to the soil increases the rate of water infiltration and improves tilth.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Installing tile drains around the footings, raising the foundations above the seasonal high water table by adding fill material, and diverting surface water help to overcome the wetness. Backfilling with sand and gravel and reinforcing the footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a recirculating sand filter and a disinfection tank.

The land capability classification is IIIe.

122C3—Colp silty clay loam, 4 to 10 percent slopes, severely eroded. This moderately sloping, moderately well drained soil is on the sides of terraces adjacent to bottom land along the Mississippi River. Individual areas are long and narrow and are 3 to 20 acres in size.

Typically, the surface layer is brown, firm silty clay loam about 6 inches thick. The subsoil is about 36 inches thick. The upper part is dark yellowish brown, very firm silty clay. The next part is yellowish brown, mottled, firm silty clay loam. The lower part is pale brown, mottled, firm and friable silt loam and loam. The underlying material to a depth of 60 inches is reddish brown and dark yellowish brown, stratified silt loam and silty clay loam. In some areas a seasonal high water table is within 2 feet of the surface. In other areas the subsoil is thinner and is stratified silty clay loam and silt loam. In places the underlying material is fine sand to fine sandy loam.

Included with this soil in mapping are small areas of the well drained Oakville soils, which formed in sandy sediment and have a low available water capacity. These soils are on terrace escarpments. They make up 5 to 10 percent of the unit.

Water and air move through the Colp soil at a slow rate. Surface runoff is medium. A seasonal high water table is 2 to 4 feet below the surface from March through June in most years. Available water capacity is moderate. Organic matter content is low. The surface layer is commonly medium acid. The subsoil also is medium acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. Some are used for hay and pasture. Many are used as sites for dwellings. This soil is moderately suited to hay and pasture and poorly suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation dominated by meadow or small grain crops. Returning crop residue to the soil and adding other organic material increase the rate of water infiltration and improve tilth.

Good pasture and hayland management improves the quality and quantity of forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Installing tile drains around the foundation footings, raising the foundations above the seasonal high water table by adding fill material, and diverting surface water

help to overcome the wetness. Backfilling with sand and gravel and reinforcing the footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a recirculating sand filter and a disinfection tank.

The land capability classification is IVe.

127B—Harrison silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on upland ridges and knolls. Individual areas are oval and are 3 to 40 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is dark brown, friable silt loam about 3 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silty clay loam. The lower part is strong brown, friable clay loam. In some areas, the soil formed entirely in loess and the lower part of the subsoil and the underlying material are silty clay loam or silt loam. In other areas the surface layer is thinner or lighter in color.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt soils on the lower ridges. These soils have a high content of sodium in the subsoil. Also included are the poorly drained Piasa and Virden soils in swales. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Harrison soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period March through May in most years. Available water capacity is high. Organic matter content also is high. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is medium acid or slightly acid. It has a moderate shrink-swell potential. The surface layer is friable and can be easily tilled when moist. It tends to crust and puddle, however, after hard rains. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is well suited to cultivated crops and moderately suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces or contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Subsurface drains help to lower the water table. Enlarging the absorption area helps to overcome the moderate permeability.

The land capability classification is IIe.

127C2—Harrison silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on prominent ridges. Individual areas are circular or oval and are 3 to 40 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark yellowish brown and yellowish brown, friable silty clay loam. The next part is yellowish brown, mottled, friable silty clay loam and silt loam. The lower part is strong brown, mottled, friable silt loam. In some areas, the soil is formed entirely in loess and the lower part of the subsoil contains less sand. In other areas the surface layer is thinner or lighter in color.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt, Herrick, and Oconee soils. Darmstadt soils have a high content of sodium in the subsoil. They are on the lower ridges. Herrick and Oconee soils are on low ridges. They have a seasonal high water table within 3 feet of the surface. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Harrison soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period March through May in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer is neutral because of local liming practices. The subsoil is slightly acid or medium acid. It has a moderate shrink-swell potential. The surface layer can be easily tilled when moist. It tends to crust or puddle, however, after hard rains because it contains some subsoil material. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used for hay and pasture or as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops, dwellings, and septic tank absorption fields. It is well suited to hay and pasture.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled, however, by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, terraces, and a crop rotation that includes meadow or small grain crops. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

A cover of hay or pasture plants helps to control erosion and runoff. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundation of dwellings with basements reduces the wetness.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Enlarging the absorption area helps to overcome the moderate permeability. Perimeter drains reduce the wetness.

The land capability classification is IIIe.

150A—Onarga sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on stream terraces. Individual areas are long and narrow or irregular in shape and are 10 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable sandy loam about 9 inches thick. The subsurface layer is very dark grayish brown, friable sandy loam about 7 inches thick. The subsoil is about 23 inches thick. The upper part is dark brown and strong brown, friable sandy loam. The lower part is strong brown, very friable loamy sand. The underlying material to a depth of 60 inches is strong brown, loose fine sand. In some areas the soil has more silt and less sand to a depth of 60 inches. In other areas the surface layer and the upper part of the subsoil are silt loam and silty clay loam. In places the surface layer is lighter colored.

Included with this soil in mapping are small areas of the somewhat poorly drained Ridgeville soils in swales and the poorly drained Ambraw soils on bottom land. Also included are a few small areas of soils that are subject to rare flooding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the subsoil in the Onarga soil at a moderately rapid rate and through the lower part of the soil at a rapid rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil and underlying material are strongly acid or medium acid. The potential for frost action is moderate.

Most areas are used for soybeans, wheat, and specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is well suited to cultivated crops and specialty crops. It is well suited to dwellings and poorly suited to septic tank absorption fields.

Drought and wind erosion are hazards in the areas used for cultivated crops or specialty crops. A system of conservation tillage that leaves crop residue on the surface after planting, green manure and cover crops, and the regular additions of other organic material conserve moisture and help to control wind erosion. Irrigation increases the moisture supply. Windbreaks help to control wind erosion. Maintaining properly spaced buffer areas of wheat or rye during the spring helps to control wind erosion in areas where specialty crops are grown.

Because of the rapid permeability, ground water pollution is a hazard if this soil is used as a site for a conventional septic tank absorption field. A sealed sand filter and a disinfection tank reduce this hazard.

The land capability classification is IIs.

151—Ridgeville fine sandy loam. This nearly level, somewhat poorly drained soil is on terraces. Individual areas are irregular in shape and are 10 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, friable fine sandy loam about 10 inches thick. The subsoil is about 34 inches thick. The upper part is dark grayish brown, mottled, friable fine sandy loam. The next part is brown, mottled, friable fine sandy loam. The lower part is dark brown, mottled, very friable loamy fine sand. The underlying material to a depth of 60 inches is dark brown and brown, mottled, loose fine sand. In some areas the soil is fine sand or loamy fine sand to a depth of 60 inches. In other areas the lower part of the subsoil and the underlying material are stratified silt loam and silty clay loam.

Included with this soil in mapping are small areas of the well drained Onarga soils on the higher parts of the terraces and the poorly drained Ambraw soils on bottom land. Also included, on the lower parts of the terraces, are a few small areas of soils that are subject to rare flooding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Ridgeville soil at a moderate rate and through the lower part of the subsoil and the underlying material at a moderately rapid rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the period March through May in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer is neutral because of local liming practices. The subsoil is slightly acid or neutral. The potential for frost action is high.

Most areas are used for soybeans, wheat, or specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is moderately suited to cultivated crops and well suited to melons. It is poorly suited to dwellings and septic tank absorption fields.

Drought and wind erosion are hazards in the areas used for crops. Cover crops and a system of

conservation tillage that leaves crop residue on the surface after planting conserve moisture and help to control wind erosion. Properly managing crop residue and planting green manure or cover crops help to maintain fertility and tilth. Maintaining properly spaced buffer areas of wheat or rye during the spring helps to control wind erosion in the areas where specialty crops are grown.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The seasonal high water table is a limitation on sites for septic tank absorption fields. It can be lowered by subsurface drains.

The land capability classification is IIs.

165—Weir silt loam. This nearly level, poorly drained soil is on broad, loess-covered uplands. It is ponded for brief periods in the spring. Individual areas are long and irregular in shape and are 3 to 90 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown and light brownish gray, friable silt loam about 14 inches thick. The subsoil extends to a depth of 60 inches. The upper part is grayish brown, mottled, firm and very firm silty clay loam. The next part is light brownish gray, mottled, very firm and firm silty clay loam. The lower part is light brownish gray, mottled, friable silt loam. In some areas the upper part of the subsoil contains more clay. In other areas the depth to a seasonal high water table is more than 2 feet.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst soils on slight rises and the moderately well drained, gently sloping Rozetta soils on knolls. These soils are not subject to ponding. They have less clay in the subsoil than the Weir soil. They make up 10 to 15 percent of the unit.

Water and air move through the Weir soil at a very slow rate. Surface runoff is slow to ponded. A perched seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through June in most years. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil ranges from very strongly acid in the upper part to slightly acid in the lower part. The shrink-swell potential is high in the subsoil. The potential for frost action is high.

Most areas are used for corn, small grain, or soybeans. This soil is moderately suited to cultivated crops, hay, and pasture. It is poorly suited to dwellings and septic tank absorption fields.

A drainage system is needed in the areas used for soybeans, corn, and small grain. A combination of random subsurface drains and surface inlets or of shallow ditches and outlets improves drainage. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and fertility. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

If this soil is used for hay or pasture, the wetness is a limitation. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by the shrinking and swelling.

The ponding and the very slow permeability are limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a sealed sand filter and a disinfection tank. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

180—Dupo silt loam. This nearly level, somewhat poorly drained soil is on flood plains. It is occasionally flooded for brief periods from March through June. Individual areas are irregular in shape and are 10 to 100 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The underlying material extends to a depth of 60 inches. The upper part is stratified brown, yellowish brown, and grayish brown, mottled, very friable silt loam. The next part is dark gray, mottled, firm silty clay loam. The lower part is a buried soil of very dark gray and dark gray, mottled, firm and very firm silty clay. In some areas the soil does not have a dark buried soil. In other areas it contains more sand. In some places the dark buried soil is silt loam. In other places the surface layer is dark.

Included with this soil in mapping are small areas of the well drained Arenzville and Haymond soils on the slightly higher parts of the flood plains and the poorly drained Darwin soils in swales and depressions. Darwin soils are subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the underlying material in the Dupo soil at a moderate rate and through the lower part at a slow rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.5 feet

below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral. The underlying material is neutral or mildly alkaline. The shrink-swell potential is high in the buried soil. The potential for frost action is high.

Most areas are used for corn, soybeans, or horseradish. This soil is moderately suited to cultivated crops and pasture. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding, the seasonal wetness, the high shrink-swell potential, and the slow permeability.

The flooding normally does not interfere with the growth of crops. After heavy rainfall, water often remains standing in flat or depressional areas for extended periods. This water may hamper crop production. Where wetness is a problem, a combination of surface ditches or of subsurface drains and outlets improves drainage. A system of conservation tillage that returns crop residue to the soil helps to maintain good tilth and improves the rate of water infiltration. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The land capability classification is IIIw.

214B—Hosmer silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridges. Individual areas are long and irregular in shape and are 10 to 80 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark brown, friable silt loam about 5 inches thick. The subsoil is about 39 inches thick. The upper part is dark brown and dark yellowish brown, friable and firm silt loam. The next part is yellowish brown, firm silt loam. The lower part is a fragipan of yellowish brown, mottled, firm and brittle silty clay loam. The underlying material to a depth of 60 inches is brown and dark yellowish brown silt loam. In some areas a perched seasonal high water table is within 2.5 feet of the surface. In other areas the subsoil has a clay content of more than 35 percent.

Water and air move through the upper part of the subsoil at a moderate rate and through the lower part at a very slow rate. Surface runoff is medium. A perched seasonal high water table is 2.5 to 3.0 feet below the surface during March and April in most years. Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is strongly acid or very strongly acid. It has a moderate shrink-swell potential. Root development is somewhat restricted by the fragipan. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is well suited to cultivated crops. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

Erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces or contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the very slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by installing a sealed sand filter and a disinfection tank. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIe.

242A—Kendall silt loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on terraces along the major streams. Individual areas are irregular in shape and are 5 to 40 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 8 inches thick. The subsoil is about 30 inches thick. The upper part is dark brown and dark yellowish brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, friable silt loam. In places a seasonal high water table is more than 3 feet below the surface. In some areas the subsoil contains more sand and less silt and clay throughout. In other areas it contains more clay.

Water and air move through this soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is medium acid or strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. Many are used as sites for dwellings. This soil is well suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for soybeans and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Installing subsurface drains in areas where outlets are available improves drainage. A system of conservation tillage that returns crop residue to the soil and regular additions of other organic material increase the rate of

water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIw.

243B—St. Charles silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on terrace ridges along the major streams. Individual areas are irregular in shape and are 5 to 40 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsurface layer is dark yellowish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown, mottled, friable and firm silt loam and silty clay loam. The next part is dark yellowish brown and yellowish brown, mottled, firm silty clay loam. The lower part is dark yellowish brown, mottled, friable fine sandy loam and yellowish brown, mottled, friable, stratified very fine sandy loam and silt loam. In some areas the soil is stratified throughout. In other areas the surface layer and subsoil contain more sand. In some places a seasonal high water table is within 3 feet of the surface. In other places the surface layer is thicker and darker.

Included with this soil in mapping are small areas of the well drained Oakville soils, which formed in sandy sediment on terraces. These soils make up 10 to 15 percent of the unit.

Water and air move through the St. Charles soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 3 to 6 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is strongly acid. The subsoil is medium acid or slightly acid. It has moderate shrink-swell potential. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist, but it tends to crust and puddle after hard rains.

Most areas are used for soybeans, corn, or wheat. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is moderately suited to dwellings and poorly suited to septic tank absorption fields.

Erosion is a hazard in the areas used for soybeans and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The shrink-swell potential and the seasonal wetness are limitations on sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings helps to lower the water table on sites for dwellings with basements.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIe.

248—McFain silty clay. This nearly level, poorly drained soil is on flood plains. It is subject to ponding in the spring. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow or irregular in shape and are 20 to 80 acres in size.

Typically, the surface layer is very dark gray, very firm silty clay about 8 inches thick. The subsurface layer is very dark gray, mottled, very firm silty clay about 6 inches thick. The subsoil is about 24 inches thick. The upper part is dark gray, mottled, very firm silty clay. The next part is dark grayish brown, mottled, firm silty clay loam. The lower part is dark gray, mottled, friable very fine sandy loam. The underlying material to a depth of 60 inches is dark gray and gray, mottled, friable, stratified very fine sandy loam and loamy very fine sand. In some areas the loamy material is higher in the subsoil. In other areas it is closer to the surface. In some places a seasonal high water table is more than 2 feet below the surface. In other places the surface layer is thinner.

Included with this soil in mapping are small areas of the well drained Landes soils, which formed in loamy alluvium over sandy alluvium. These soils are on the slightly higher rises on the flood plains. Also included, near drainageways, are a few small areas where local flooding occasionally occurs. Included areas make up 10 to 15 percent of the unit.

Water and air move through the McFain soil at a slow rate. Surface runoff is very slow. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is slightly acid or neutral. The surface layer is very firm when moist and very hard and cloddy when dry. The shrink-swell potential is high. Deep, wide cracks form at the surface because the soil shrinks when it is dry. The potential for frost action is high.

Most areas are used for soybeans or wheat. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained and protected for the production of cultivated crops. After heavy rainfall, water often remains standing in swales or small depressional areas. This water may hamper crop production. The drainage system should be maintained, and in some areas additional drains are needed. Installing surface ditches at close intervals where outlets are available improves drainage. A system of conservation tillage that adds organic material to the soil improves tilth and increases the rate of water infiltration.

The ponding, the high shrink-swell potential, and the flooding are severe limitations on sites for buildings. Raising the ground level by adding fill material helps to divert surface water. Backfilling around foundations with sand and gravel, installing tile drains, and reinforcing footings helps to prevent the damage caused by shrinking and swelling and by wetness. An extensive system of levees reduces the hazard of flooding.

The ponding and the slow permeability are severe limitations on sites for septic tank absorption fields. The soil can be used as a site for sewage lagoons if the slowly permeable material is at least 4 feet thick.

The land capability classification is IIw.

278A—Stronghurst silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad, loess-covered till plains. Individual areas are irregular in shape and are 5 to 180 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, friable silt loam about 10 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown and brown, firm silty clay loam. The next part is light brownish gray, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silt loam. In some areas the subsoil has more clay. In other areas a seasonal high water table is more than 3 feet below the surface. In places the surface layer is darker.

Included with this soil in mapping are small areas of the poorly drained Weir soils in depressions. These soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Stronghurst soil at a moderate or moderately slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during the period April through June in most years. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is neutral to medium acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a limitation, random subsurface drains and surface inlets improve drainage. Returning crop residue to the soil and regularly adding other organic material improve tilth and increase the rate of water infiltration.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the foundations helps to lower the water table. Diverting surface water and raising the foundations of dwellings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

The seasonal wetness and the restricted permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the restricted permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIw.

278B—Stronghurst silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on broad ridges in the uplands. Individual areas are irregular in shape and are 3 to 200 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, friable silt loam about 10 inches thick. The subsoil is about 38 inches thick. The upper part is brown, pale brown, and light brownish gray, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, firm silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the subsoil has more clay. In other areas a seasonal high water table is more than 3 feet below the surface.

Included with this soil in mapping are small areas of the well drained Fayette soils on side slopes. These soils make up 10 to 15 percent of the unit.

Water and air move through the Stronghurst soil at a moderate or moderately slow rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface during the period April through June in most years. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is strongly acid. It

has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields.

Erosion is a hazard in the cultivated areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a limitation, random subsurface drains and surface inlets improve drainage. Properly managing crop residue and regularly adding other organic material increase the rate of infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the restricted permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the restricted permeability. Subsurface drains help to lower the water table.

The land capability classification is IIe.

279B—Rozetta silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridges. Areas are long and irregular in shape and are 10 to 80 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is firm silty clay loam about 45 inches thick. The upper part is yellowish brown, the next part is yellowish brown and mottled, and the lower part is brown and mottled. The underlying material to a depth of 60 inches is grayish brown, mottled, friable silt loam. In places the lower part of the subsoil and the underlying material are firm and brittle. In some areas the surface layer is darker. In other areas the subsoil contains more clay. In some places a seasonal high water table is below a depth of 6 feet. In other places it is within 4 feet of the surface.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Reaction of the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is slightly acid to strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is well suited to cultivated crops and moderately suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces or contour farming. Returning crop residue to the soil and regularly adding other organic material also help to control erosion. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IIe.

279B3—Rozetta silty clay loam, 2 to 5 percent slopes, severely eroded. This gently sloping, moderately well drained soil is along shallow drainageways. Individual areas are long and narrow or irregular in shape and are 5 to 60 acres in size.

Typically, the surface layer consists of subsoil material. It is dark grayish brown and dark yellowish brown, firm silty clay loam about 8 inches thick. The subsoil is about 16 inches thick. The upper part is gray, mottled, firm silty clay loam. The next part is light gray, mottled, friable silty clay loam. The lower part is gray, mottled, friable silt loam. The underlying material to a depth of 60 inches is gray and light brownish gray, mottled, friable silt loam. In places the subsoil is thicker and contains more clay. In some areas a seasonal high water table is within 4 feet of the surface. In other areas it is below a depth of 6 feet. In places the subsoil and the underlying material contain more sand and gravel.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt soils, which have a high content of sodium in the subsoil. These soils are on side slopes. They make up 5 to 10 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface from April through June in most years. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is

medium acid or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation that includes small grain crops. The surface layer is firm when moist and hard and cloddy when dry. As a result, preparing a seedbed is difficult. Properly managing crop residue and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table.

The seasonal wetness and the moderate permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IIIe.

279C2—Rozetta silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on ridges and side slopes along drainageways. Individual areas are oval or irregular in shape and are 10 to 45 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 8 inches thick. The subsoil is about 49 inches thick. The upper part is dark yellowish brown, friable and firm silty clay loam. The next part is brown and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas a seasonal high water table is within 4 feet of the surface. In other areas it is below a depth of 6 feet. In places the subsoil is thinner and contains less clay.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is slightly acid or medium acid. It has a moderate shrink-swell potential. The surface layer is friable but tends to crust or puddle after hard rains. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation that includes meadow or small grain crops. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The slope, the seasonal wetness, and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Altering the site by cutting and filling helps to overcome the slope. Installing subsurface drains around footings helps to lower the water table.

The seasonal wetness, the moderate permeability, and the slope are limitations on sites for septic tank absorption fields. Installing the absorption fields on the contour helps to overcome the slope. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IIIe.

279C3—Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded. This moderately sloping, moderately well drained soil is along drainageways. Individual areas are irregular in shape and are 3 to 30 acres in size.

Typically, the surface layer is mostly subsoil material. It is dark yellowish brown, firm silty clay loam about 7 inches thick. The subsoil is about 38 inches thick. The upper part is yellowish brown, firm silty clay loam. The lower part is yellowish brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is brown, mottled, friable silt loam. In some areas the lower part of the subsoil and the underlying material have a higher content of sand and coarse fragments. In other areas the subsoil is thinner and contains less clay.

Included with this soil in mapping are small areas of the well drained Fayette and Hickory soils on the steeper slopes. These soils are not suited to cultivated crops. They make up 10 to 15 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local

liming practices but commonly is medium acid. The subsoil is medium acid or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is very poorly suited to cultivated crops and moderately suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, contour farming, and a crop rotation that is dominated by meadow crops. The surface layer is firm when moist and hard and cloddy when dry. As a result, preparing a seedbed is difficult. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

The slope, the seasonal wetness, and the shrink-swell potential are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table. Altering the site by cutting and filling helps to overcome the slope.

The seasonal wetness, the moderate permeability, and the slope are limitations on sites for septic tank absorption fields. Installing the absorption fields on the contour helps to overcome the slope. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IVe.

279D3—Rozetta silty clay loam, 10 to 15 percent slopes, severely eroded. This strongly sloping, moderately well drained soil is on side slopes in highly dissected areas. Individual areas are irregular in shape and are 3 to 20 acres in size.

Typically, the surface layer consists mostly of subsoil material. It is dark brown, firm silty clay loam about 5 inches thick. The subsoil is about 38 inches thick. The upper part is brown and strong brown, friable silty clay loam. The lower part is brown, mottled, friable silty clay loam and silt loam. The underlying material to a depth of 60 inches is brown, mottled, friable silt loam. In some areas the soil is more sloping. In other areas the lower part of the subsoil and the underlying material are a buried soil that contains more clay and sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on bottom land. These soils make up 10 to 15 percent of the unit.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is rapid. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Organic matter content is low. Reaction varies in the surface layer because of local liming practices but commonly is medium acid. The subsoil is strongly acid or medium acid. it has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for cultivated crops, hay, or pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is very poorly suited to cultivated crops and moderately suited to dwellings and septic tank absorption fields. It is well suited to hay and pasture.

Water erosion is a severe hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation dominated by meadow crops. The surface layer is firm when moist and hard and cloddy when dry. As a result, preparing a seedbed is difficult. Returning crop residue to the soil increases the rate of water infiltration and improves tilth.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The seasonal wetness, the shrink-swell potential, and the slope are limitations on sites for dwellings. Constructing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table. Reinforcing footings and foundations and extending the footings in fill areas into the undisturbed soil help to prevent the structural damage caused by shrinking and swelling. Diverting runoff from the higher areas reduces the wetness and helps to prevent structural damage.

The seasonal wetness, the moderate permeability, and the slope are limitations on sites for septic tank absorption fields. Installing the absorption fields on the contour helps to overcome the slope. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IVe.

280B—Fayette silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridges in the

uplands. Individual areas are long and irregular in shape and are 10 to 80 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 5 inches thick. The subsurface layer is brown and yellowish brown, very friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark yellowish brown, friable silt loam and firm silty clay loam. The lower part is yellowish brown, firm silty clay loam. In some areas the subsoil contains more clay. In other areas a seasonal high water table is 4 to 6 feet below the surface. In places the subsoil is silt loam throughout and is firm and brittle in the lower part.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst soils on the lower ridges and knolls. These soils make up 10 to 15 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of past liming practices. The subsoil is medium acid or strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. This soil is well suited to cultivated crops, moderately suited to dwellings, and well suited to septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The shrink-swell potential is a limitation on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

The land capability classification is IIe.

280C2—Fayette silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on ridges and side slopes. Individual areas are irregular in shape and range from 5 to 35 acres in size.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsoil is yellowish brown silty clay loam about 35 inches thick. The upper part is firm, and the lower part is friable. The underlying material to a depth of 60 inches is yellowish brown, friable silt loam. In some severely eroded areas, the surface layer is firm silty clay loam. In some places the lower part of the subsoil contains more sand. In other places free carbonates are within a depth of 40 inches.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst, Marine, and Wakeland soils. Stronghurst and Marine soils are on the less sloping ridgetops, and Wakeland soils are on narrow bottom land. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is neutral to medium acid. It has a moderate shrink-swell potential. The surface layer is friable and can be easily tilled, but it tends to crust or puddle after hard rains. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and dwellings. It is well suited to septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes meadow or small grain crops. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The shrink-swell potential and the slope are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Altering the site by cutting and filling helps to overcome the slope.

The land capability classification is IIIe.

280D2—Fayette silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on side slopes along drainageways. Individual areas are irregular in shape and range from 3 to 30 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil is yellowish brown silty clay loam about 41 inches thick. The upper part is firm, the next part is very firm, and the lower part is firm. The underlying material to a depth of 60 inches is yellowish brown, friable silt loam. In some areas the subsoil and underlying material contain more sand and gravel. In severely eroded areas, the surface layer is yellowish brown, firm silty clay loam. In places the subsoil is thinner and contains less clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on narrow bottom land. These soils make up less than 5 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is rapid. Available water

capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is slightly acid to strongly acid. It has a moderate shrink-swell potential. The surface layer is friable and can be easily tilled when moist. It tends to crust or puddle, however, after hard rains. The potential for frost action is high.

Most areas are used for cultivated crops, hay, or pasture. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to hay and pasture. It is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes meadow or small grain crops. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The shrink-swell potential and the slope are limitations on sites for dwellings. Constructing benches by cutting and filling helps to overcome the slope. Compacting the fill improves stability. Diverting runoff from the higher areas and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Extending footings in the fill areas into the undisturbed soil helps to stabilize the structure.

The slope is a limitation on sites for septic tank absorption fields. Installing a series of absorption trenches on the contour helps to overcome this limitation. Separate filling of the individual trenches can be achieved by using a distribution box or by installing a serial distribution system.

The land capability classification is IIIe.

280E3—Fayette silty clay loam, 15 to 20 percent slopes, severely eroded. This moderately steep, well drained soil is on side slopes in highly dissected areas. Individual areas are irregular in shape and range from 10 to 30 acres in size.

Typically, the surface layer is subsoil material. It is dark yellowish brown, firm silty clay loam about 8 inches thick. The subsoil is about 36 inches thick. The upper part is dark yellowish brown, firm silty clay loam. The next part is brown, mottled, firm silty clay loam. The lower part is yellowish brown, mottled, firm silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the lower part of the subsoil and the underlying material contain more clay and sand. In other areas the soil has a higher content of sand and coarse fragments.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils on bottom land. Also included are the moderately well drained Gosport soils, which formed in material weathered from shale and are on sides slopes below the Fayette soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is very rapid. Available water capacity is high. Organic matter content is low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is medium acid or slightly acid. It has a moderate shrink-swell potential. The surface layer is firm when moist and hard and cloddy when dry. The potential for frost action is high.

Most areas are used for cultivated crops, hay, or pasture. This soil is generally unsuited to cultivated crops because of the severe erosion. It is moderately suited to pasture and well suited to woodland. It is poorly suited to dwellings and septic tank absorption fields.

A permanent cover of pasture plants helps to control water erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Competing vegetation can be controlled by chemicals.

The slope is a severe limitation on sites for dwellings and septic tank absorption fields. Altering the site by cutting and filling helps to overcome the slope on sites for dwellings. Installing the filter lines on the contour

helps to overcome this limitation on sites for septic tank absorption fields.

The land capability classification is VIe.

280F—Fayette silt loam, 15 to 30 percent slopes. This steep, well drained soil is on side slopes along drainageways in highly dissected areas. Individual areas are irregular in shape and range from 10 to 30 acres in size.

Typically, the surface layer is very dark gray, friable silt loam about 4 inches thick. The subsurface layer is dark brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silty clay loam. The lower part is strong brown, firm silt loam. In some areas the soil has a higher content of sand and coarse fragments. In other areas the lower part of the subsoil and the underlying material are a buried soil that contains more clay and sand. In some places the subsoil is thinner, contains less clay, and has free carbonates in the lower part. In severely eroded areas, the surface layer is silty clay loam. In some areas, dominantly on north- and east-facing slopes, the slope is more than 30 percent.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland soils in narrow drainageways and the well drained Raddle soils on foot slopes that are subject to siltation. Also included, within Alton, are areas of Urban land. Included areas make up 5 to 10 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is very rapid. Available water capacity is high. Organic matter content is moderately low. The surface layer commonly is medium acid. The subsoil is medium acid to very strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are wooded. Some are used for hay and pasture. Some are used as sites for urban development. This soil is well suited to pasture and moderately suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the steep slope.

A permanent cover of pasture plants helps to control water erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Competing vegetation can be controlled by chemicals.

The land capability classification is VIe.

284—Tice silt loam. This nearly level, somewhat poorly drained soil is on flood plains. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow or irregular in shape and are 10 to 140 acres in size.

Typically, the surface layer is very dark gray, firm silt loam about 8 inches thick. The subsurface layer is very dark gray, firm silty clay loam about 8 inches thick. The subsoil is about 36 inches thick. The upper part is very dark grayish brown, dark brown, and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm silt loam that has lenses of loam. The underlying material to a depth of 60 inches is mottled light brownish gray, yellowish brown, and light olive brown, friable and very friable, stratified silt loam and very fine sandy loam. In some areas the surface layer is thinner and lighter in color. In other areas a seasonal high water table is within 1 foot of the surface. In some places the soil is dark to a depth of more than 24 inches. In other places it is more stratified and does not have a subsoil. In some areas the lower part of the subsoil and the underlying material are loamy very fine sand to fine sand. In other areas they are silty clay.

Included with this soil in mapping are small areas of the well drained Landes and Raddle soils on ridges and the poorly drained Beaucoup soils in depressions. Beaucoup soils are subject to ponding. Also included, near drainageways, are a few small areas of soils that are more frequently flooded than the Tice soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Tice soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface during the period March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is medium acid or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Many are used as sites for dwellings. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently protected against flooding for the production of corn, soybeans, and small grain.

Returning crop residue to the soil increases the rate of water infiltration and improves tilth. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The seasonal wetness and the flooding are severe limitations on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness. An extensive system of levees reduces the frequency of flooding on this soil.

The wetness is a severe limitation on sites for septic tank absorption fields. It can be overcome by mounding and by installing a sealed sand filter and a disinfection tank. Diverting surface water away from the filter bed helps to keep the system functioning properly.

The land capability classification is I.

302—Ambraw loam. This nearly level, poorly drained soil is on bottom land. It is subject to ponding. Levees generally provide protection against overflow from the Mississippi River. The soil is subject to rare flooding, however, during periods of unusually heavy rainfall or snowmelt. Individual areas are irregular in shape and are 10 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, friable loam about 9 inches thick. The subsurface layer is very dark brown, friable loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark grayish brown, mottled, friable clay loam. The next part is dark grayish brown, mottled, firm sandy clay loam. The lower part is dark grayish brown, mottled, friable fine sandy loam. In some areas a seasonal high water table is more than 2 feet below the surface. In other areas the soil has less clay and more sand to a depth of 60 inches. In places a dark buried soil of silty clay is below a depth of 40 inches.

Included with this soil in mapping are small areas of Darwin soils, which formed in clayey alluvium in swales on bottom land. These soils are subject to ponding. Also included, near drainageways, are a few small areas of soils that are more frequently flooded than the Ambraw soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Ambraw soil at a moderate or moderately slow rate. Surface runoff is very slow. A seasonal high water table is near or above the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is medium acid. It has a moderate shrink-swell potential. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans or small grain. Many are used as sites for urban development. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil generally is sufficiently drained and protected for the production of the crops commonly grown in the county. After heavy rainfall, however, water often remains standing in swales or depressional areas for extended periods. This water may hamper crop production. Where wetness is a problem, surface ditches or subsurface drains and outlets improve drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve the rate of water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The seasonal wetness and the flooding are severe limitations on sites for dwellings. Raising the ground level by adding fill material helps to divert surface water. If drainage outlets are available, installing tile drains around the foundations also helps to overcome the wetness. An extensive system of levees reduces the frequency of flooding on this soil.

The seasonal wetness and the restricted permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by mounding and by installing a sealed sand filter and a disinfection tank.

The land capability classification is IIw.

304B—Landes very fine sandy loam, 1 to 5 percent slopes. This gently sloping, well drained soil is on natural levees on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow and are 10 to 40 acres in size.

Typically, the surface soil is very dark grayish brown, very friable very fine sandy loam about 16 inches thick. The subsoil is brown, very friable very fine sandy loam about 17 inches thick. The underlying material to a depth of 60 inches is brown, mottled, stratified loamy very fine sand, very fine sandy loam, and silt loam. In some areas the soil is stratified silt loam to a depth of 60 inches. In other areas the underlying material is silty clay loam or silty clay. In some places the surface layer is lighter in color. In other places a seasonal high water table is within 4 feet of the surface. In some areas the soil is fine sand or loamy fine sand throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki and poorly drained McFain and Beaucoup soils. Nameoki soils formed in clayey alluvium over loamy alluvium. They are on bottom land. McFain and Beaucoup soils are in swales and depressions. Also included, near drainageways, are a few small areas of soils that are more frequently flooded than the Landes soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow.

Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is neutral. The surface layer is friable and can be easily tilled when moist. The potential for frost action is moderate.

Most areas are used for soybeans, wheat, or horseradish. Many are used as sites for dwellings. This soil is well suited to cultivated crops and specialty crops. It is poorly suited to dwellings and septic tank absorption fields.

Drought and wind erosion are hazards in the areas used for cultivated or specialty crops. Returning crop residue to the soil and regularly adding other organic material help to control wind erosion, improve tilth, and conserve moisture. Irrigation increases the moisture supply. Maintaining properly spaced buffer areas of wheat and rye during the spring helps to control erosion in areas where specialty crops are grown.

This soil is well suited to dwellings, but the rare flooding is a hazard. An extensive system of levees reduces this hazard.

Because of the rapid permeability, ground water pollution is a hazard if this soil is used as a site for standard septic tank absorption fields. A sealed sand filter and a disinfection tank help to prevent this pollution.

The land capability classification is IIe.

331—Haymond silt loam. This well drained, nearly level soil is on flood plains along the major rivers and small streams. It is frequently flooded for brief periods from March through May. Individual areas are irregular in shape and are 10 to 200 acres in size.

Typically, the surface soil is dark grayish brown, friable silt loam about 14 inches thick. The underlying material to a depth of 60 inches is stratified. The upper part is dark brown and yellowish brown, friable silt loam. The lower part is pale brown, very friable very fine sandy loam. In some areas the surface layer is darker. In other areas a dark silt loam or silty clay loam buried soil is within a depth of 40 inches. In places the lower part of the underlying material is loamy fine sand or sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Dupo, Orion, and Wakeland soils in the lower swales on bottom land. These soils make up 10 to 15 percent of the unit.

Water and air move through the Haymond soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer is typically medium acid but varies because of past liming practices. The underlying material is neutral to medium acid. The surface layer is friable and can be easily tilled when moist. The potential for frost action is high.

Most areas are used for corn, soybeans, or horseradish. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

The flooding normally does not interfere with the growth of crops. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The land capability classification is IIw.

333—Wakeland silt loam. This nearly level, somewhat poorly drained soil is on bottom land along the major streams and their tributaries. It is frequently flooded for brief periods from March through May. Individual areas are irregular in shape and are 10 to 200 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The underlying material to a depth of 60 inches is stratified. It is dark grayish brown and grayish brown, mottled, friable silt loam. In some areas the surface layer is darker. In other areas a buried, dark layer is within a depth of 40 inches. In places the underlying material contains more sand.

Included with this soil in mapping are small areas of the poorly drained Birds soils in swales on bottom land. These soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Wakeland soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from January through April in most years. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The underlying material is neutral or slightly acid. The potential for frost action is high.

Most areas are used for soybeans or corn. Some are wooded. This soil is well suited to cultivated crops and woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the seasonal wetness.

This soil is sufficiently drained for the crops commonly grown in the county. The flooding normally does not interfere with the growth of crops. Where wetness is a problem, surface ditches or a combination of subsurface drains and outlets improves drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The land capability classification is IIw.

334—Birds silt loam. This nearly level, poorly drained soil is on bottom land along the major streams. It is

frequently flooded for long periods from March through June in most years and is subject to ponding. Individual areas are irregular in shape and are 40 to 600 acres in size.

Typically, the surface layer is dark gray, mottled, firm silt loam about 8 inches thick. The underlying material to a depth of 60 inches consists of very dark gray to light gray, mottled, stratified silty deposits. The upper part is firm, and the lower part is friable. In some areas the surface layer is dark silty clay loam. In other areas a dark buried soil is below a depth of 30 inches. In some places the underlying material has thicker strata of silty clay loam. In other places, the underlying material contains less clay and the depth to the seasonal high water table is more than 1 foot.

Included with this soil in mapping are small areas of undrained soils used only for wetland wildlife habitat. These soils make up 10 to 15 percent of the unit.

Water and air move through the Birds soil at a moderately slow rate. Surface runoff is very slow or ponded. A seasonal high water table ranges from 0.5 foot above the surface to 1.0 foot below from March through June in most years. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The underlying material is slightly acid to strongly acid. The potential for frost action is high.

Most areas are cultivated. Some are wooded. This soil is moderately suited to cultivated crops and woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the ponding.

This soil is sufficiently drained for the production of the crops commonly grown in the county. The flooding normally does not interfere with the growth of crops. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a limitation, surface ditches or a combination of subsurface drains and outlets improves drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The land capability classification is IIIw.

338—Hurst silty clay loam. This nearly level, somewhat poorly drained soil is on terraces. It is subject to rare flooding. Individual areas are irregular in shape and are 3 to 40 acres in size.

Typically, the surface layer is dark grayish brown, mottled, firm silty clay loam about 6 inches thick. The subsoil is mottled, firm silty clay about 33 inches thick. The upper part is dark grayish brown, and the lower part is olive brown. The underlying material to a depth of 60 inches is stratified dark brown and dark yellowish brown, firm silty clay loam and silty clay. In some areas the subsoil is silty clay loam or silt loam. In other areas the underlying material has thick strata of sand or loamy sand. In places a seasonal high water table is more than 3 feet below the surface.

Water and air move through this soil at a very slow rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface during March and April in most years. Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is very strongly acid to neutral. It has a high shrink-swell potential. The potential for frost action is moderate.

Most areas are used for soybeans or small grain. Many are used as sites for dwellings. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

This soil is sufficiently drained for the production of the crops commonly grown in the county. The drainage system should be maintained. In some areas additional drainage measures are needed. A system of surface drains helps to remove excess water if drainage outlets are available. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and the formation of clods.

The land capability classification is IIIw.

386B—Downs silt loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil is on ridgetops and knolls. It is relatively undissected by drainageways and commonly is in the highest positions on the landscape. Most areas are circular or oblong and range from 3 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is dark brown, friable silt loam about 4 inches thick. The subsoil extends to a depth of 60 inches. It is dark yellowish brown. The upper part is firm silt loam, the next part is firm silty clay loam, and the lower part is mottled, firm and friable silty clay loam and silt loam. In some areas the surface layer is thinner or is lighter in color. In other areas a seasonal high water table is within 4 feet of the surface. In places the subsoil contains more clay.

Included with this soil in mapping are small areas of the poorly drained Sable and Virden soils in upland swales. These soils are subject to ponding. They make up 5 to 10 percent of the unit.

Water and air move through the Downs soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of past liming practices but commonly is slightly acid. The subsoil is medium acid to neutral. It has a moderate shrink-swell potential. The potential for frost action is high. The surface layer is friable and can be easily tilled.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and moderately suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by terraces, or by contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The shrink-swell potential and the seasonal wetness are limitations on sites for dwellings. Reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations helps to lower the water table.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IIe.

386C2—Downs silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, moderately well drained soil is on ridgetops, knolls, and side slopes. Areas are circular or oblong on ridgetops and knolls and irregular in shape on side slopes. They are 3 to 50 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 7 inches thick. The subsoil is about 39 inches thick. The upper part is yellowish brown and brown, firm silty clay loam. The lower part is pale brown, mottled, friable silt loam. The underlying material to a depth of 60 inches is pale brown, mottled, friable silt loam. In some areas the dark surface layer is thicker. In other areas a seasonal high water-table is within 4 feet of the surface. In some severely eroded areas, the surface layer is firm silty clay loam. In places it is lighter colored.

Water and air move through this soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction varies in the surface layer because of past liming practices but commonly is slightly acid. The subsoil is slightly acid or neutral. It has a moderate shrink-swell potential. The potential for frost action is high. The surface layer is friable but tends to crust or puddle after hard rains.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops, dwellings, and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces, a crop rotation that includes meadow or small grain crops, or contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The shrink-swell potential and the seasonal wetness are limitations on sites for dwellings. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations helps to lower the water table.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderate permeability. Subsurface drains help to lower the water table.

The land capability classification is IIIe.

409—Aquents, clayey. These nearly level, poorly drained soils are on bottom land. They are subject to ponding. They formed in material altered by extensive cutting and filling. Levees generally provide protection against overflow from the Mississippi River. The soils are subject to rare flooding, however, during periods of unusually heavy rainfall or snowmelt. Individual areas are blocky and range from 30 to 300 acres in size.

The soil material in this map unit is dark gray or gray, very firm silty clay or clay to a depth of 60 inches. Individual soil horizons are no longer distinguishable. In some undisturbed areas, the surface layer is very dark gray or black.

Included with these soils in mapping are small areas of Orthents, loamy, which are moderately well drained. Also included are small, manmade lakes, which formerly were borrow areas, and a few areas where the clayey soil material has been used in highway cloverleaf embankments and the soils are steep and are not so

poorly drained as the Aquents. Included areas make up 10 to 15 percent of the unit.

Water and air move through the Aquents at a very slow rate. Runoff is very slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is moderate. Organic matter content also is moderate. The shrink-swell potential is very high. The potential for frost action is moderate.

These soils are used for industrial development. They are poorly suited to this use and to dwellings. They are generally unsuited to septic tank absorption fields because of the wetness and the very slow permeability. They are well suited to sewage lagoons.

After heavy rainfall, water often remains standing in the flatter or depressional areas for extended periods. This standing water provides havens for mosquito infestations. Installing a surface drainage system helps to remove excess water. Plants used for landscaping commonly cannot be easily established because root penetration is restricted by the compacted clay fill. This limitation can be overcome by a combination of mulching and deep tillage.

The very high shrink-swell potential, the seasonal wetness, and the flooding are severe limitations on sites for buildings. Raising the ground level by adding fill material helps to divert surface water. Backfilling around foundations with sand and gravel, installing tile drains, and reinforcing footings help to prevent the structural damage caused by shrinking and swelling and by wetness. An extensive system of levees reduces the frequency of flooding on these soils.

This map unit is not assigned to a land capability classification.

415—Orion silt loam. This nearly level, somewhat poorly drained soil is on bottom land along major streams and tributaries. It is frequently flooded for brief periods from March to May in most years. Individual areas are irregular in shape and are 20 to 100 acres in size.

Typically, the surface layer is dark grayish brown, very friable silt loam about 7 inches thick. The underlying material is stratified grayish brown, brown, and dark grayish brown, mottled, very friable silt loam about 28 inches thick. Below this to a depth of 60 inches is a buried soil of mottled, friable silt loam. The upper part of the buried soil is very dark gray and very dark grayish brown, and the lower part is dark grayish brown. In some areas the dark buried soil is below a depth of 40 inches. In other areas it contains more clay. In places the surface layer is darker.

Included with this soil in mapping are small areas of the poorly drained Birds soils in swales. These soils are subject to ponding. Also included are the well drained Arenzville soils on the slightly higher parts of the bottom land. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Orion soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through May. Available water capacity is very high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The underlying material is slightly acid or medium acid. The potential for frost action is high.

Most areas are used for soybeans or corn. Some are wooded. This soil is well suited to cultivated crops. It is moderately suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the seasonal wetness.

The flooding normally does not interfere with the growth of crops. Where wetness is a problem, surface ditches or a combination of subsurface drains and outlets improves drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

In the areas used as woodland, the equipment limitation is a management concern because of the flooding. Machinery should be operated only when the soil is firm enough to support the equipment. Protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The land capability classification is IIw.

430A—Raddle silt loam, 0 to 3 percent slopes. This nearly level, well drained soil is on low terraces and foot slopes. Levees generally provide protection against overflow, but the soil is subject to rare flooding. Individual areas are irregular in shape and are 3 to 40 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is dark brown, friable silt loam about 8 inches thick. The subsoil to a depth of 60 inches is friable silt loam. The upper part is yellowish brown, and the lower part is brown and mottled. In some areas the surface layer is thinner or is not so dark. In other areas it is thicker.

Included with this soil in mapping are small areas of the somewhat poorly drained Tice soils on bottom land and the poorly drained Beaucoup soils in swales and depressions. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Raddle soil at a moderate rate. Surface runoff is slow. Available water capacity is very high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid.

The subsoil is slightly acid or neutral. The potential for frost action is high.

Most areas are used for soybeans, wheat, corn, or horseradish. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and moderately suited to septic tank absorption fields because of the flooding.

Water erosion is a hazard in the more sloping areas used for cultivated crops. It can be controlled by a system of conservation tillage that returns crop residue to the soil and contour farming. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

The flooding is a hazard on sites for dwellings and septic tank absorption fields. An extensive system of levees reduces the frequency of flooding.

The land capability classification is I.

430B—Raddle silt loam, 3 to 6 percent slopes. This gently sloping, well drained soil is on foot slopes. Individual areas are long and narrow and are 3 to 50 acres in size.

Typically, the surface layer is dark brown, very friable silt loam about 13 inches thick. The subsoil is friable silt loam about 27 inches thick. The upper part is brown, and the lower part is dark yellowish brown. The underlying material to a depth of 60 inches is dark yellowish brown, very friable silt loam. In some areas the surface layer is thicker. In other areas the subsoil contains more clay. In places the soil does not have a subsoil and is stratified silt loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Wakeland and Orion soils on bottom land. These soils make up 10 to 15 percent of the unit.

Water and air move through the Raddle soil at a moderate rate. Surface runoff is medium. Available water capacity is very high. Organic matter content is moderate. Reaction in the surface layer and subsoil is neutral. The potential for frost action is high.

Most areas are used for soybeans, wheat, corn, or horseradish. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops, septic tank absorption fields, and dwellings.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces or contour farming. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. The soil receives runoff from areas upslope. As a result, it is subject to sedimentation unless it is protected.

The land capability classification is IIe.

451—Lawson silt loam. This nearly level, somewhat poorly drained soil is on bottom land along small streams. It is frequently flooded for brief periods from March through June in most years. Individual areas are irregular in shape and are 10 to 40 acres in size.

Typically, the surface layer is black, friable silt loam about 9 inches thick. The subsurface layer is also black, friable silt loam. It is about 21 inches thick. The underlying material to a depth of 60 inches is mottled, friable silt loam. The upper part is very dark gray and dark grayish brown, and the lower part is grayish brown. In some areas the surface layer is thinner or lighter in color. In other areas the soil contains more sand throughout. In places a seasonal high water table is within 1 foot of the surface.

Included with this soil in mapping are small areas of the poorly drained Birds soils in swales on the lower parts of the bottom land. These soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Lawson soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through May in most years. Available water capacity is very high. Organic matter content is high. Reaction in the surface layer and the underlying material is neutral. The shrink-swell potential is moderate in the underlying material. The potential for frost action is high.

Most areas are used for corn or soybeans. This soil is well suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the seasonal wetness.

The flooding normally does not interfere with the growth of crops. Where the wetness or the flooding is a problem, surface ditches or subsurface drains improve drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The land capability classification is IIw.

452A—Riley clay loam, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on low ridges on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow and are 10 to 60 acres in size.

Typically, the surface layer is very dark grayish brown, firm clay loam about 11 inches thick. The subsoil is about 13 inches thick. The upper part is dark grayish brown, mottled, firm sandy clay loam. The lower part is dark brown, mottled, very friable loamy sand. The underlying material to a depth of 60 inches is stratified dark yellowish brown, pale brown, and grayish brown, mottled, loose sand. In some areas the subsoil is thicker and is deeper to sand. In other areas the surface layer is thinner.

Included with this soil in mapping are small areas of the poorly drained Beaucoup soils in swales and depressions. These soils are subject to ponding. Also included are the poorly drained McFain soils, which are very slowly permeable and are in swales on the lower parts of the bottom land; the well drained Landes soils; and a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Riley soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface from April through June in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is slightly acid or neutral. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans or wheat. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields.

This soil is sufficiently protected for production of cultivated crops. Drought is a hazard late in the summer, and erosion is a hazard in the steeper areas. A system of conservation that leaves crop residue on the surface after planting conserves moisture and helps to maintain fertility and tilth. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

The seasonal wetness and the flooding are severe limitations on sites for dwellings. Raising the ground level by adding fill material helps to divert surface water and thus reduces the wetness. An extensive system of levees reduces the frequency of flooding on this soil.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. Also, ground water pollution is a hazard because of the rapid permeability. A sealed sand filter and a disinfection tank overcome the wetness and prevent ground water contamination.

The land capability classification is IIs.

474—Piasa silt loam. This nearly level, poorly drained soil is on broad flats and in depressions on till plains. It is ponded in winter and early in spring. Individual areas are broad and irregular in shape and are 10 to 100 acres in size.

Typically, the surface layer is very dark grayish brown, very friable silt loam about 9 inches thick. The subsurface layer is grayish brown, very friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. It has a high content of sodium. The upper part is grayish brown, mottled, very firm silty clay. The lower part is light brownish gray and light olive gray, mottled, very firm and firm silty clay loam. In some areas the surface layer is lighter in color. In other areas it is thicker. In places the soil does not have a light colored silt loam subsurface layer.

Included with this soil in mapping are small areas of the somewhat poorly drained Herrick and Oconee soils and the poorly drained Cowden and Virden soils. These soils do not have a high content of sodium. Herrick and Oconee soils are in the more sloping areas, and Cowden and Virden soils are on broad flats. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Piasa soil at a very slow rate. Surface runoff is very slow or ponded. A perched seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through May in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer is neutral. The subsoil is slightly acid to strongly alkaline. It has a high shrink-swell potential. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans, corn, or wheat. Some are used for hay and pasture. This soil is moderately suited to cultivated crops and to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields. It is well suited to sewage lagoons.

The ponding and the high content of sodium are limitations in the areas used for cultivated crops. The sodium in the subsoil causes moisture stress during dry periods and reduces the availability and uptake of some plant nutrients. A combination of narrowly spaced subsurface drains and surface inlets or of shallow ditches and outlets can improve drainage but may not be economically feasible. The sodium in the subsoil may cause silting of the tile lines. A system of conservation tillage that leaves crop residue on the surface after planting improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods and decreases the rate of water infiltration.

A cover of hay or pasture plants helps to maintain or improve tilth. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundation of dwellings without basements above the perched water

table by adding fill material also help to overcome the wetness.

The ponding and the very slow permeability are severe limitations on sites for septic tank absorption fields. Installing a buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

517A—Marine silt loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil is on broad, low lying upland ridges. Individual areas are long and irregular in shape and are 3 to 120 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, mottled, very firm silty clay. The next part is grayish brown, mottled, very firm silty clay loam. The lower part is light brownish gray, mottled, firm silty clay loam and friable silt loam. In some areas the surface layer is darker. In other areas the subsoil contains less clay. In places a seasonal high water table is within 1 foot of the surface.

Included with this soil in mapping are small areas of the moderately well drained Hosmer soils, which have fragipan characteristics in the subsoil. These soils are on convex ridges. Also included are the somewhat poorly drained Darmstadt soils, which have a high content of sodium in the subsoil. These soils are on slight upland rises. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Marine soil at a slow rate. Surface runoff is slow. A perched seasonal high water table is 1 to 2 feet below the surface from January through May in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is very strongly acid. The subsoil is very strongly acid to slightly acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields. It is well suited to sewage lagoons.

This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a problem, random subsurface drains and surface inlets improve drainage. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the damage caused by shrinking and swelling. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also reduces the wetness.

The land capability classification is IIw.

517B—Marine silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil is on broad upland ridges and knolls. Individual areas are oblong or irregular in shape and are 3 to 60 acres in size.

Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is grayish brown and light brownish gray, mottled, friable silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, mottled, firm silty clay loam. The next part is yellowish brown, mottled, very firm silty clay. The lower part is light brownish gray, mottled, very firm and firm silty clay loam. In some areas the surface layer is darker. In other areas the subsoil contains less clay. In severely eroded areas, the surface layer is silty clay loam.

Included with this soil in mapping are small areas of the poorly drained Rushville soils in slight depressions. These soils are subject to ponding. Also included are the moderately well drained Hosmer soils, which have fragipan characteristics in the subsoil and are on narrow ridges and the somewhat poorly drained Darmstadt soils, which have a high content of sodium in the subsoil and are on slight upland rises. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Marine soil at a slow rate. Surface runoff is medium. A perched seasonal high water table is 1 to 2 feet below the surface from January through May in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is very strongly acid to medium acid. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops. It is poorly suited to dwellings and septic tank absorption fields. It is moderately suited to sewage lagoons.

This soil is sufficiently drained for the production of corn, soybeans, and small grain. The drainage system should be maintained, and in some areas additional drainage measures are needed. Where wetness is a problem, random subsurface drains and surface inlets improve drainage. Water erosion is a hazard. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces. Returning crop residue to the soil and adding other organic material increase the rate of water infiltration and improve tilth. Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also helps to overcome the wetness. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

The land capability classification is IIe.

533—Urban land. This map unit consists of nearly level to gently sloping areas covered by parking lots, streets, buildings, and other structures. Most areas are in the western part of the county. Individual areas are blocky and are 20 to more than 250 acres. Slopes range from 0 to 5 percent.

Urban land consists mostly of shopping centers, industrial plants, other commercial sites, and streets and parking lots. These areas make up more than 75 percent of the map unit. In most of the remaining open areas, cutting and filling have so altered the soil that identification of the soil series is not possible.

Included with this unit in mapping are small areas of Orthents, loamy, and Dumps. Dumps are piles of refuse. Orthents, loamy, consist of areas which have been cut and filled with loamy soil material. Included areas make up 10 to 15 percent of the unit.

Runoff is very rapid on the Urban land. Most paved areas are designed so that runoff flows into a storm drainage system. Controlling runoff reduces the susceptibility to erosion in adjacent areas and helps to control local flooding.

This map unit is not assigned to a land capability classification.

536—Dumps. This map unit consists of nearly level to very steep piles of industrial refuse, mine spoil, and slag. Most areas of industrial refuse and slag are in the urbanized, western part of the county. The mine spoil is mainly in the south-central and northeastern parts of the county. Individual areas are irregularly shaped or blocky and are 5 to 80 acres in size.

The mine spoil consists of waste from coal mines. It is generally a few inches to several feet thick. It supports no vegetation because of very strong acidity.

The industrial refuse and slag piles consist of waste material from factories. They do not support vegetation.

Included with this unit in mapping are small areas of Orthents, silty. These soils are along the border of the mapped areas. They have been cut and filled with silt loam or silty clay loam and support a minimal amount of vegetation. They make up 10 to 15 percent of the unit.

This map unit is not assigned to a land capability classification.

581B2—Tamalco silt loam, 2 to 5 percent slopes, eroded. This gently sloping, moderately well drained soil is on convex ridgetops. Individual areas are oval and are 10 to 40 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. It is mixed with brown, very firm silty clay subsoil material. The subsoil is about 30 inches thick. The upper part is brown, mottled, very firm silty clay and silty clay loam. The next part is yellowish brown, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silt loam. The middle and lower parts have a high content of sodium. The underlying material to a depth of 60 inches is yellowish brown and brown, mottled, friable silt loam. In some areas a seasonal high water table is within a depth of 3 feet. In other areas the soil is deeper to a high content of exchangeable sodium. In places the subsoil contains less clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Oconee soils on the lower ridges and the poorly drained, nearly level Cowden soils on uplands. These soils do not have a high content of sodium in the subsoil. They make up 10 to 15 percent of the unit.

Water and air move through the Tamalco soil at a very slow rate. Surface runoff is medium. A seasonal high water table is 3 to 5 feet below the surface during March and April in most years. Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil ranges from strongly acid to neutral in the upper part and is moderately alkaline in the lower part. It has a high shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to

cultivated crops and poorly suited to dwellings and septic tank absorption fields. It is moderately suited to sewage lagoons.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes 1 year or more of small grain or meadow crops. The high content of sodium in the subsoil causes moisture stress and reduces the availability and uptake of some plant nutrients. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth and fertility.

The high shrink-swell is a severe limitation on sites for dwellings. Reinforcing footings and foundations and backfilling with sand and gravel help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the very slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also helps to overcome the wetness. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

The land capability classification is IIIe.

583B—Pike silt loam, 2 to 5 percent slopes. This gently sloping, well drained soil is on ridges. Individual areas are oblong or oval and are 10 to 80 acres in size.

Typically, the surface layer is dark yellowish brown, friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silty clay loam. The lower part is strong brown, friable silt loam. In some areas the lower part of the subsoil is dense and brittle. In severely eroded areas, the surface layer has been mixed with the subsoil through cultivation and is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Marine and Oconee soils. These soils are nearly level and gently sloping and are in areas below the Pike soil. They make up 5 to 10 percent of the unit.

Water and air move through the Pike soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is neutral to strongly acid. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops, dwellings, and septic tank absorption fields.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by terraces or contour farming. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

The land capability classification is IIe.

583C2—Pike silt loam, 5 to 10 percent slopes, eroded. This moderately sloping, well drained soil is on the sides of ridges. Individual areas are oval and are 10 to 60 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 9 inches thick. It is mixed with yellowish brown silty clay loam subsoil material. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown and dark brown, firm silty clay loam. The lower part is brown and dark brown, firm and friable silt loam. In some areas the lower part of the subsoil is dense and brittle. In severely eroded areas, the surface layer has been mixed with the subsoil through cultivation and is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Darmstadt and Marine soils. These soils are nearly level and gently sloping and are in areas below the Pike soil. They make up 5 to 10 percent of the unit.

Water and air move through the Pike soil at a moderate rate. Surface runoff is medium. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is neutral to strongly acid. The potential for frost action is high.

Most areas are used for corn, soybeans, or small grain. Some are used as sites for septic tank absorption fields and dwellings or for hay and pasture. This soil is moderately suited to cultivated crops. It is well suited to hay and pasture, septic tank absorption fields, and dwellings.

Water erosion is a hazard in the areas used for corn, soybeans, and small grain. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes small grain or meadow crops. Returning crop residue to the soil and regularly adding other organic material improve fertility, increase the rate of water infiltration, and improve tilth. Tilling when the soil is wet causes surface compaction, decreases the rate of water infiltration, and causes excessive runoff and erosion.

A cover of hay or pasture plants helps to control erosion. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture

rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The land capability classification is IIIe.

583D2—Pike silt loam, 10 to 15 percent slopes, eroded. This strongly sloping, well drained soil is on the sides of ridges. Individual areas are oval or irregular in shape and are 10 to 40 acres in size.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The subsoil to a depth of 60 inches is firm silty clay loam. The upper part is strong brown, the next part is brown, and the lower part is strong brown. In some severely eroded areas, the surface layer has been mixed with the subsoil through cultivation and is silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained, nearly level and gently sloping Marine and Oconee soils. These soils are in areas below the Pike soil. They make up 5 to 10 percent of the unit.

Water and air move through the Pike soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is very strongly acid. The subsoil is slightly acid to very strongly acid. The potential for frost action is high.

Most areas are used for cultivated crops. Some are used for hay and pasture. This soil is moderately suited to cultivated crops and well suited to hay and pasture. It is moderately suited to dwellings and septic tank absorption fields.

Water erosion is a hazard in the areas used for cultivated crops. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes 1 year or more of small grain or meadow crops. Returning crop residue to the soil and regularly adding other organic material improve fertility, increase the rate of water infiltration, and improve tilth.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The slope is a moderate limitation on sites for dwellings. It can be overcome by cutting and filling. Compacting the fill improves stability.

The slope is a moderate limitation on sites for septic tank absorption fields. Installing a series of absorption trenches on the contour helps to overcome this limitation. Separate filling of the individual trenches can be achieved by using a distribution box or by installing a serial distribution system.

The land capability classification is IIIe.

585E—Negley loam, 15 to 25 percent slopes. This moderately steep and steep, well drained soil is on upland side slopes. Individual areas are long or irregular in shape and are 5 to 45 acres in size.

Typically, the surface layer is dark grayish brown, friable loam about 3 inches thick. The subsurface layer is yellowish brown, friable loam about 4 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish red, firm clay loam. The next part is strong brown, mottled, firm clay loam. The lower part is strong brown, firm sandy clay loam and yellowish red, firm gravelly clay loam. In some areas the subsoil contains less sand and gravel. In other areas the soil is silt loam and silty clay loam throughout. In places the subsoil has more clay.

Included with this soil in mapping are small areas of the somewhat poorly drained Stronghurst and Marine soils, which are nearly level and gently sloping. Also included are the poorly drained Birds and somewhat poorly drained Wakeland soils on stream bottoms. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Negley soil at a moderate rate. Surface runoff is rapid. Available water capacity is moderate. Organic matter content is moderately low. The surface layer is medium acid. The subsoil is medium acid and strongly acid. The potential for frost action is moderate.

Most areas are wooded or are used for hay and pasture. This soil is well suited to woodland and moderately suited to hay and pasture. It is generally unsuited to cultivated crops, dwellings, and septic tank absorption fields because of the slope.

A permanent cover of pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery

only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used.

The land capability classification is VIe.

592A—Nameoki silty clay, 0 to 3 percent slopes. This nearly level, somewhat poorly drained soil is on flood plains. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow or irregular in shape and are 10 to 50 acres in size.

Typically, the surface layer is very dark gray, firm silty clay about 6 inches thick. The subsurface layer is very dark gray, firm silty clay about 5 inches thick. The subsoil is about 43 inches thick. The upper part is dark brown and brown, mottled, very firm silty clay. The next part is brown, mottled, extremely firm silty clay. The lower part is grayish brown, mottled, firm and friable, stratified silt loam, silty clay loam, and very fine sandy loam. The underlying material to a depth of 60 inches is grayish brown, mottled, friable, stratified silt loam and silty clay loam. In some areas the lower part of the subsoil and the underlying material are silty clay. In other areas a seasonal high water table is within a depth of 1 foot. In some places the surface layer and subsurface layer are silt loam. In other places the surface layer is thinner.

Included with this soil in mapping are small areas of the poorly drained Darwin soils, which are in the lower depressions and swales and are subject to ponding, and the well drained Landes soils, which formed in loamy alluvium on the slightly higher ridges. Also included, near drainageways, are a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Nameoki soil at a very slow rate and through the lower part of the subsoil and the underlying material at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer is neutral because of local liming practices. The subsoil is strongly acid to slightly acid. It has a high shrink-swell potential. The potential for frost action is high. The surface layer is very firm when moist and hard and cloddy when dry.

Most areas are used for soybeans or wheat. Many are used for urban development. This soil is well suited to cultivated crops. It is poorly suited to dwellings and sewage lagoons. It is generally unsuited to septic tank absorption fields because of the wetness and the very slow permeability.

This soil is sufficiently protected by levees for the production of the crops commonly grown in the county. Measures that improve drainage and tilth are needed. Where wetness is a problem, narrowly spaced subsurface drains and surface inlets improve drainage. A system of conservation tillage that adds organic material to the soil improves tilth and increases the rate of water infiltration.

The flooding is a severe hazard on sites for dwellings. An extensive system of levees reduces the frequency of flooding on this soil. The seasonal wetness and the high shrink-swell potential are severe limitations. Raising the ground level by adding fill material helps to divert surface water. Backfilling around foundations with sand and gravel, installing tile drains around the foundations, and reinforcing footings help to prevent the structural damage caused by shrinking and swelling and by wetness.

The seasonal wetness is a severe limitation on sites for sewage lagoons. A lagoon is an effective means of waste management if the floor is covered with 2 feet of slowly permeable material.

The land capability classification is IIw.

620B2—Darmstadt silt loam, 2 to 5 percent slopes, eroded. This gently sloping, somewhat poorly drained soil is on slight rises and knolls in the uplands. Individual areas are irregular in shape and are 5 to 80 acres in size.

Typically, the surface layer is dark brown, friable silt loam about 6 inches thick. The subsoil is about 43 inches thick. It has a high content of sodium. The upper part is brown, mottled, firm silty clay. The next part is pale brown and light brownish gray, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silty clay loam. The underlying material to a depth of 60 inches is light gray, friable silt loam. In some areas a seasonal high water table is more than 3 feet below the surface. In other areas the subsoil averages more than 35 percent clay.

Included with this soil in mapping are small areas of the poorly drained Huey soils in shallow depressions. These soils are subject to ponding. Also included are the somewhat poorly drained Oconee soils, which do not have a high content of sodium in the subsoil and are on the slightly narrower ridges. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Darmstadt soil at a very slow rate. Surface runoff is medium. A perched seasonal high water table is 1 to 3 feet below the surface from March through May in most years. Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer is neutral. The subsoil is mildly alkaline to strongly alkaline. It has a moderate shrink-swell potential. The potential for frost action is high. Tilth is poor, and the surface layer is cloddy when dry.

Most areas are used for soybeans, corn, or wheat. Some are used as sites for dwellings and septic tank absorption fields. This soil is moderately suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields. It is moderately suited to sewage lagoons.

Water erosion and the high content of sodium are limitations in the areas used for cultivated crops. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes 1 year or more of meadow or small grain crops. The high content of sodium in the subsoil causes moisture stress and reduces the availability and uptake of some plant nutrients. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth and fertility. Random subsurface drains and surface inlets improve drainage. The sodium in the subsoil may cause silting in the tile lines.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also helps to overcome the wetness. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

The land capability classification is IIIe.

620C3—Darmstadt silty clay loam, 3 to 8 percent slopes, severely eroded. This gently sloping and moderately sloping, somewhat poorly drained soil is on side slopes along shallow drainageways. Individual areas are long and irregular in shape and range from 5 to 25 acres in size.

Typically, the surface layer is exposed subsoil material. It is dark yellowish brown, firm silty clay loam about 10 inches thick. The subsoil is light brownish gray, mottled silty clay loam about 19 inches thick. It has a high content of sodium. The underlying material to a depth of 60 inches is light brownish gray and brown, mottled, friable silt loam. In some areas the subsoil contains more sand.

Included with this soil in mapping are small areas of the moderately well drained Rozetta soils on side slopes and the somewhat poorly drained Oconee, Marine, and Stronghurst soils on the slightly narrower ridges. These soils do not have a high content of sodium in the subsoil. They make up 10 to 15 percent of the unit.

Water and air move through the Darmstadt soil at a very slow rate. Surface runoff is medium. A perched seasonal high water table is 1 to 3 feet below the surface from March through May in most years. Available water capacity is moderate. Organic matter content is low. The surface layer and subsoil are moderately alkaline. The shrink-swell potential is moderate in the subsoil. The potential for frost action is high. Tilth is poor, and the surface layer is cloddy when dry.

Most areas are used for cultivated crops. Some are used for hay and pasture. This soil is poorly suited to cultivated crops. It is moderately suited to hay and pasture. It is poorly suited to dwellings and septic tank absorption fields and moderately suited to sewage lagoons.

Water erosion and the high content of sodium are limitations in the areas used for cultivated crops. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation that includes 1 year or more of meadow or small grain crops. The high content of sodium causes moisture stress and reduces the availability and uptake of some plant nutrients. Returning crop residue to the soil and regularly adding other organic material improve fertility, increase the rate of water infiltration, and improve tilth. Hillside seeps are in some areas. Random subsurface drains and surface inlets improve drainage. The high content of sodium in the subsoil may cause silting in the tile lines.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The seasonal wetness is a severe limitation on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table.

The seasonal wetness and the very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the very slow permeability. Subsurface drains help to lower the water table. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

The land capability classification is IVe.

741B—Oakville fine sand, 2 to 5 percent slopes. This gently sloping, well drained soil is on terraces. Individual areas are long and narrow or irregular in shape and are 10 to 40 acres in size.

Typically, the surface layer is dark yellowish brown, loose fine sand about 8 inches thick. The subsoil is dark brown, loose fine sand about 21 inches thick. The underlying material to a depth of 60 inches is strong brown, loose fine sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Ridgeville soils on the

lower parts of the landscape and the poorly drained Ambraw soils on bottom land. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Oakville soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is slightly acid.

Most areas are used for soybeans, wheat, or specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is moderately suited to cultivated crops and specialty crops if it is irrigated but is poorly suited to these crops if not irrigated. It is well suited to dwellings and poorly suited to septic tank absorption fields. It is moderately suited to evergreens.

Low fertility, droughtiness, and wind erosion are limitations in the areas used for cultivated crops or specialty crops. Returning crop residue to the soil and regularly adding other organic material improve fertility and conserve moisture. Irrigation helps to supply moisture for the crops. Leaving crop residue on the surface and maintaining properly spaced buffer areas of wheat or rye during the spring help to control wind erosion.

If this soil is used as woodland, protection from fire and grazing is essential. Seedling mortality can be controlled by planting drought-tolerant species and by mulching, which conserves moisture. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

Because of the rapid permeability, ground water pollution is a hazard if this soil is used as a site for septic tank absorption fields. A sealed sand filter and a disinfection tank help to prevent this pollution.

The land capability classification is IVs.

741C—Oakville fine sand, 5 to 10 percent slopes. This moderately sloping, well drained soil is on the sides of terraces. Individual areas are long and narrow and are 10 to 40 acres in size.

Typically, the surface layer is dark brown, loose fine sand about 11 inches thick. The subsoil is brown, loose fine sand about 21 inches thick. The underlying material to a depth of 60 inches is also brown, loose fine sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Ridgeville soils on the lower parts of the landscape and the poorly drained Ambraw soils on bottom land. Also included are the moderately well drained St. Charles soils, which have a high available water capacity and are on the terraces. Included soils make up 5 to 10 percent of the unit.

Water and air move through the Oakville soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. Reaction in the subsoil is neutral.

Most areas are used for soybeans or wheat. Some are used for specialty crops, such as melons and pumpkins. Many are used as sites for dwellings. This soil is poorly suited to cultivated crops and specialty crops. It is well suited to dwellings and poorly suited to septic tank absorption fields. It is moderately suited to evergreens.

Droughtiness, wind erosion, and low fertility are limitations in the areas used for cultivated crops or specialty crops. Returning crop residue to the soil improves fertility, conserves moisture, and helps to control wind erosion. Irrigation helps to supply moisture and reduces the susceptibility to wind erosion. Establishing grasses and planting forage crops also help to control wind erosion.

If this soil is used as woodland, protection from fire and grazing is essential. Seedling mortality can be controlled by planting drought-tolerant species and by mulching, which conserves moisture. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

Because of the rapid permeability, ground water pollution is a hazard if this soil is used as a site for septic tank absorption fields. A sealed sand filter and disinfection tank help to prevent this pollution.

The land capability classification is IVs.

801B—Orthents, silty, undulating. These nearly level and gently sloping, moderately well drained soils typically are on uplands, but in few small areas they are on flood plains. They formed in material altered by extensive cutting and filling. Individual areas are rectangular and range from 10 to 100 acres in size. Slopes range from 0 to 5 percent.

Typically, the soil material is brown and yellowish brown, friable silt loam and silty clay loam to a depth of 60 inches. Individual horizons are no longer distinguishable. In some areas the soil material is loam or clay loam. In other areas a seasonal high water table is within 4 feet of the surface.

Included with these soils in mapping are small lakes that formerly were borrow areas. These areas make up 5 to 10 percent of the unit.

Air and water movement through these soils varies, depending on the degree of compaction by construction equipment. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Organic matter content is low.

Most areas are used for industrial development. Onsite inspection is needed to determine the limitations or hazards affecting the construction of buildings. Applying fertilizer and mulching help to establish plants.

This map unit is not assigned to a land capability classification.

801E—Orthents, silty, steep. These moderately sloping to steep, well drained soils are on uplands and

bottom land. Levees generally protect the bottom land against overflow from the Mississippi River. The soils formed in material altered by extensive cutting and filling. Individual areas are irregular in shape and range from 20 to 60 acres in size. Slopes range from 5 to 35 percent.

Typically, the soil material is brown and yellowish brown, friable silt loam and silty clay loam to a depth of 60 inches. Individual soil horizons are no longer distinguishable. In some areas the soil material is loam or clay loam.

Included with these soils in mapping are small areas between highway cloverleaf ramps. These areas are less sloping than the Orthents and are moderately well drained to somewhat poorly drained. They make up 5 to 10 percent of the unit.

Air and water movement through these soils varies, depending on the degree of compaction by construction equipment. Surface runoff is rapid. Available water capacity is high. Organic matter content is low.

Most areas are used as highway cloverleaf embankments. A few are used as small levees. Erosion is a hazard on these soils. It can be controlled by planting adapted varieties of densely growing perennials, such as crownvetch and tall fescue.

This map unit is not assigned to a land capability classification.

802B—Orthents, loamy, undulating. These nearly level to gently sloping, moderately well drained soils typically are on bottom land, but in some areas they are on uplands. Levees generally protect the bottom land against overflow from the Mississippi River. The soils formed in material altered by extensive cutting and filling. Individual areas are rectangular and range from 5 to 160 acres in size. Slopes range from 0 to 5 percent.

Typically, the soil material is brown and yellowish brown, friable loam and clay loam to a depth of 60 inches. Individual soil horizons are no longer distinguishable. In some areas the soil material is silt loam or silty clay loam. In other areas a seasonal high water table is within 4 feet of the surface.

Included with these soils in mapping are small manmade lakes that formerly were borrow areas. These areas make up 5 to 10 percent of the unit.

Air and water movement through these soils varies, depending on the degree of compaction by construction equipment. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is high. Organic matter content is low.

Most areas are used for industrial development. Onsite inspection is needed to determine the limitations or hazards affecting the construction of buildings. Applying fertilizer and mulching help to establish plants.

This map unit is not assigned to a land capability classification.

802E—Orthents, loamy, steep. These moderately sloping to steep, well drained soils typically are on bottom land, but in some areas they are on uplands. Levees generally protect the bottom land against overflow from the Mississippi River. The soils formed in material altered by extensive cutting and filling. Individual areas are rectangular or irregular in shape and range from 20 to 200 acres in size. Slopes range from 5 to 35 percent.

Typically, the soil material is brown and yellowish brown, friable loam and clay loam to a depth of 60 inches. Individual soil horizons are no longer distinguishable. In some areas the soil material is silt loam or silty clay loam.

Included with these soils in mapping are small areas between highway cloverleaf ramps. These areas are less sloping than the Orthents and are moderately well drained to somewhat poorly drained. They make up 5 to 10 percent of the unit.

Air and water movement through these soils varies, depending on the degree of compaction by construction equipment. Surface runoff is rapid. Available water capacity is high. Organic matter content is low.

Most areas are used as levees or highway cloverleaf embankments. Erosion is a hazard on these soils. It can be controlled by planting adapted varieties of densely growing perennials, such as crownvetch and tall fescue.

This map unit is not assigned to a land capability classification.

864—Pits, quarries. This map unit consists of excavations from which limestone has been removed. The bottom of the quarries generally is nearly level and gently sloping, the sides are nearly vertical. Individual areas are mainly rectangular and range from 25 to 95 acres in size.

The bottom and sidewalls are mainly exposed limestone bedrock. Strips of soil material are generally along the tops of the sidewalls, and a talus slope is along the bottom in places.

Included with this unit in mapping are roads used for hauling the quarried material, stockpiles of crushed limestone, and some areas covered with machinery and debris. Included areas make up 10 to 15 percent of the unit.

Runoff is medium in most areas but is ponded in depressional areas. All areas, except for the bands of soil material along the tops of the sidewalls support little or no vegetation.

This map unit is actively mined for limestone. It is poorly suited to most other uses. Some areas are suitable for paths and trails. Some depressional areas are suitable as pond reservoirs. Falling rock is a hazard.

This map unit is not assigned to a land capability classification.

865—Pits, gravel. This map unit consists of excavations from which gravel and some sand have been removed. It is generally on outwash plains or on stream terraces. The gravel is used mainly as roadfill or other construction material. Individual areas are square, rectangular, or irregular in shape and range from 10 to 75 acres in size.

The excavations are commonly 10 to 40 feet deep. A few areas are filled with water. The surrounding soil material generally has been scraped or mixed with sand and gravel during the mining operations. It is mainly low in fertility and organic matter content. Available water capacity varies.

Abandoned pits are commonly used for wildlife habitat or recreation areas. Some pits that have filled with water have been stocked with fish. Woody and herbaceous plants have grown in disturbed areas around the pits. These vegetated areas provide good habitat for upland wildlife. Onsite investigation is needed to plan the development for a specific use.

This map unit is not assigned to a land capability classification.

867—Oil-waste land. This map unit consists of shallow slush pits and adjoining areas where liquid waste, primarily oil residue and by-products from nearby oil refineries has been dumped. Individual areas are rectangular and range from 5 to 100 acres in size.

Included with this unit in mapping are some narrow access lanes and border areas that support a minimal amount of vegetation.

The disturbed soil material surrounding the pits has been severely altered by the oil residue and supports no vegetation. Available water capacity and permeability vary because of the variability of the soil material.

The feasibility of reclamation depends on the conditions at the site and the desired alternative use. Onsite investigation is essential to evaluate and plan the development for a specified use.

This map unit is not assigned to a land capability classification.

914C3—Atlas-Grantfork silty clay loams, 5 to 10 percent slopes, severely eroded. These moderately sloping, somewhat poorly drained soils are on side slopes. The Atlas soil is in areas below the Grantfork soil. Individual areas are long and irregular in shape and are 5 to 30 acres in size. They are 50 to 60 percent Atlas soil and 30 to 40 percent Grantfork soil. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the Atlas soil has a surface layer of dark yellowish brown, firm silty clay loam about 6 inches thick. The subsoil to a depth of 60 inches is mottled, firm clay loam. The upper part is yellowish brown, and the lower part is grayish brown. In some areas the upper part of the subsoil contains less clay and sand. In other areas the soil has more clay throughout. In places a perched seasonal high water table is more than 2 feet below the surface.

Typically, the Grantfork soil has a surface layer of dark yellowish brown, firm silty clay loam about 5 inches thick. The subsoil extends to a depth of 60 inches. It has a high content of sodium. It is, in sequence downward, dark yellowish brown, mottled, firm silty clay loam; grayish brown, mottled, firm silt loam; light brownish gray, mottled, firm loam; grayish brown, mottled, firm clay loam; and light brownish gray, mottled, firm clay loam. In some areas the lower part of the subsoil contains less sand. In other areas the subsoil contains more clay throughout.

Included with these soils in mapping are small areas of the well drained Hickory soils, which formed in glacial till on the steeper side slopes. These included soils make up 10 to 15 percent of the unit.

Water and air move through the Atlas soil at a very slow rate and through the Grantfork soil at a slow rate. Surface runoff is rapid on both soils. The Atlas soil has a perched seasonal high water table within a depth of 2 feet during the period April through June in most years. The Grantfork soil has a perched seasonal high water table 1 to 3 feet below the surface during April and May in most years. Available water capacity is moderate in both soils. Reaction is slightly acid in the surface layer of the Atlas soil and strongly acid to neutral in the subsoil. It is mildly alkaline in the surface layer of the Grantfork soil and moderately alkaline or strongly alkaline in the subsoil. Organic matter content is low in both soils. The shrink-swell potential is high in the Atlas soil and moderate in the Grantfork soil. The potential for frost action is high in both soils. The surface layer is firm when moist and hard and cloddy when dry.

Most areas are used for cultivated crops. Some are used for hay and pasture. These soils are very poorly suited to cultivated crops and moderately suited to hay and pasture. They are poorly suited to dwellings and septic tank absorption fields.

Water erosion is a severe hazard in the areas used for cultivated crops. Also, the high content of sodium in the Grantfork soil is a limitation. Erosion can be controlled by a conservation tillage system that leaves crop residue on the surface after planting, by contour farming, and by a crop rotation dominated by meadow or small grain crops. The high content of sodium in the Grantfork soil causes moisture stress and reduces the availability and uptake of some plant nutrients. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This

management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Installing subsurface drains around the foundations helps to lower the water table. Diverting runoff from upslope areas, backfilling with sand and gravel, and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow or very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the slow or very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also reduces the wetness.

The land capability classification is IVe.

914D3—Atlas-Grantfork silty clay loams, 10 to 15 percent slopes, severely eroded. These strongly sloping, somewhat poorly drained soils are on side slopes. The Atlas soil is in areas below the Grantfork soil. Individual areas are long and irregular in shape and are 3 to 30 acres in size. They are 50 to 60 percent Atlas soil and 30 to 40 percent Grantfork soil. The two soils occur as areas so intricately mixed or so small that mapping them separately is not practical.

Typically, the Atlas soil has a surface layer of brown silty clay loam about 7 inches thick. The subsoil is mottled clay loam about 47 inches thick. The upper part is brown and firm. The lower part is dark grayish brown and grayish brown and is very firm. The underlying material to a depth of 60 inches is light brownish gray, mottled, very firm loam. In some areas the soil has more clay throughout. In other areas a perched seasonal high water table is more than 2 feet below the surface.

Typically, the Grantfork soil has a surface layer of dark yellowish brown, firm silty clay loam about 9 inches thick. The subsoil is mottled, firm clay loam about 45 inches thick. It has a high content of sodium. The upper part is brown and yellowish brown, the next part is grayish brown, and the lower part is grayish brown and light brownish gray. The underlying material to a depth of 60 inches is light brownish gray, mottled, firm loam. In some areas the lower part of the subsoil contains less sand. In other areas the subsoil contains more clay throughout.

Included with these soils in mapping are small areas of the somewhat poorly drained Orion soils on narrow bottom land and the well drained Hickory soils, which formed in glacial till on side slopes below the Atlas soil. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Atlas soil at a very slow rate and through the Grantfork soil at a slow rate. Surface runoff is rapid on both soils. The Atlas soil has a perched seasonal high water table within a depth of 2 feet during the period April through June in most years. The Grantfork soil has a perched seasonal high water table 1 to 3 feet below the surface during April and May in most years. Available water capacity is moderate in the Atlas soil and low in the Grantfork soil. Reaction is medium acid in the surface layer of the Atlas soil and strongly acid to mildly alkaline in the subsoil. It is neutral in the surface layer of the Grantfork soil and moderately alkaline or strongly alkaline in the subsoil. Organic matter content is low in both soils. The shrink-swell potential is high in the Atlas soil and moderate in the Grantfork soil. The potential for frost action is high in both soils. The surface layer is firm when moist and hard and cloddy when dry.

Most areas are used for cultivated crops, hay, or pasture. These soils are generally unsuited to cultivated crops because of a severe erosion hazard. They are moderately suited to hay, pasture, and woodland and poorly suited to dwellings and septic tank absorption fields.

A cover of hay or pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing. The high content of sodium in the Grantfork soil causes moisture stress and reduces the availability and uptake of some plant nutrients.

If this soil is used as woodland, protection from fire and grazing is essential. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The seasonal wetness and the shrink-swell potential are limitations on sites for dwellings. Installing subsurface drains around the foundations helps to lower the water table. Diverting runoff from upslope areas, backfilling with sand and gravel, and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow or very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the slow or very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed also reduces the wetness.

The land capability classification is VIe.

916B—Darmstadt-Oconee silt loams, 1 to 5 percent slopes. These gently sloping, somewhat poorly drained

soils are on broad upland ridges and knolls. Individual areas are irregular in shape and are 10 to 100 acres in size. They are 50 to 60 percent Darmstadt soil and from 30 to 40 percent Oconee soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Darmstadt soil has a surface layer of dark grayish brown, friable silt loam about 9 inches thick. The subsoil is about 49 inches thick. It has a high content of sodium. The upper part is brown, firm silty clay loam. The next part is grayish brown, mottled, firm and very firm silty clay loam. The lower part is light brownish gray, mottled, firm silty clay loam and friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the subsoil averages more than 35 percent clay. In other areas a seasonal high water table is more than 3 feet below the surface.

Typically, the Oconee soil has a surface layer of very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil to a depth of 60 inches is mottled silty clay loam. The upper part is brown and is friable and firm, the next part is grayish brown and firm, and the lower part is grayish brown and friable. In some areas the surface layer is lighter in color. In severely eroded areas, the surface layer is silty clay loam and the soil has no subsurface layer.

Included with these soils in mapping are small areas of the poorly drained Cowden, Huey, Piasa, and Virden soils in slight depressions. These included soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Darmstadt soil at a very slow rate and through the Oconee soil at a slow rate. Surface runoff is medium on both soils. A seasonal high water table is 1 to 3 feet below the surface during the period March through May in most years. Available water capacity is moderate in the Darmstadt soil and high in the Oconee soil. Organic matter content is moderately low in the Darmstadt soil and moderate in the Oconee soil. The shrink-swell potential is moderate in the subsoil of the Darmstadt soil and high in the subsoil of the Oconee soil. Reaction in the surface layer of both soils is neutral because of local liming practices. The subsoil of Darmstadt soil is medium acid to moderately alkaline, and that of the Oconee soil is strongly acid to slightly acid. The potential for frost action is high in both soils. The surface layer is friable and can be easily tilled when moist, but it tends to crust or puddle after hard rains.

Most areas are used for soybeans, corn, or wheat. Some are used as sites for dwellings and septic tank absorption fields. These soils are moderately suited to cultivated crops and poorly suited to dwellings and septic tank absorption fields. They are moderately suited to sewage lagoons.

Erosion on both soils and the high content of sodium in the Darmstadt soil are limitations in the areas used for cultivated crops. Erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. The high content of sodium in the Darmstadt soil causes moisture stress late in the growing season and limits the availability and uptake of some plant nutrients. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth and fertility. Random subsurface drains and surface inlets improve drainage. The sodium in the Darmstadt soil may cause silting in the tile lines.

The seasonal wetness of both soils is a severe limitation on sites for dwellings. The high shrink-swell potential of the Oconee soil also is a severe limitation. Installing subsurface drains around the foundation helps to lower the water table. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability or very slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the slow or very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

The land capability classification is IIIe.

920—Rushville-Huey silt loams. These nearly level, poorly drained soils are on broad flats and in depressions on uplands. They are subject to ponding. Individual areas are irregular in shape and are 20 to 150 acres in size. They are 50 to 60 percent Rushville soil and 30 to 40 percent Huey soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Rushville soil has a surface layer of dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is dark grayish brown and light brownish gray, friable silt loam about 11 inches thick. The subsoil extends to a depth of 60 inches. The upper part is light brownish gray, mottled, very firm silty clay. The next part is light brownish gray, mottled, very firm silty clay loam. The lower part is olive gray, mottled, firm silty clay loam. In some areas the surface layer is darker. In other areas the depth to a perched seasonal high water table is more than 2 feet. In places the subsoil contains less clay.

Typically, the Huey soil has a surface layer of dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is light brownish gray, friable silt loam about 5 inches thick. The subsoil extends to a depth of

60 inches. It has a high content of sodium. The upper part is grayish brown and light brownish gray, mottled, firm silty clay loam. The lower part is grayish brown and light grayish brown, mottled, firm and friable silt loam. In some areas the subsoil contains more clay. In other areas the surface layer is darker. In places the depth to a perched seasonal high water table is more than 2 feet.

Included with these soils in mapping are small areas of the moderately well drained Tamalco soils on the higher knolls. These included soils make up 5 to 10 percent of the unit.

Water and air move through the Rushville and Huey soils at a very slow rate. Surface runoff is very slow or ponded. During the period March through June in most years, the Rushville soil has a perched seasonal high water table 1.0 foot above the surface to 1.0 foot below and the Huey soil has one 0.5 foot above the surface to 2.0 feet below. Available water capacity is high in the Rushville soil and moderate in the Huey soil. Organic matter content is moderately low in both soils. Reaction is strongly acid in the surface layer of the Rushville soil and slightly acid to strongly acid in the subsoil. It is slightly acid in the surface layer of the Huey soil and medium acid to moderately alkaline in the subsoil. The shrink-swell potential is high in the subsoil of the Rushville soil and moderate in the subsoil of the Huey soil. The potential for frost action is high in both soils. The surface layer is friable and can be easily tilled, but it tends to crust and puddle after hard rains.

Most areas are used for soybeans, corn, or wheat. Some are used for hay and pasture. These soils are moderately suited to hay and pasture and poorly suited to cultivated crops, dwellings, and septic tank absorption fields. They are well suited to sewage lagoons.

The perched water table is a limitation in the areas used for cultivated crops. A combination of narrowly spaced subsurface drains and surface inlets or of shallow ditches and outlets improves drainage. The high content of sodium in the subsoil of the Huey soil may cause silting in the tile lines. Also, it causes moisture stress during dry periods and reduces the availability and uptake of some plant nutrients. Returning crop residue to the soil improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods and decreases the rate of water infiltration.

In the areas used for hay and pasture, the wetness of both soils and the content of sodium in the subsoil of the Huey soil are limitations. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes a drainage system, applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding is a severe hazard on sites for dwellings. Also, the high shrink-swell potential of the Rushville soil is a severe limitation. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings above the water table by adding fill material also help to overcome the wetness. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The ponding and the very slow permeability are severe limitations on sites for septic tank absorption fields. The very slow permeability can be overcome by mounding and by installing a recirculating sand filter. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IVw.

936F—Fayette-Hickory complex, 15 to 30 percent slopes. These steep, well drained soils are on upland side slopes. The Fayette soil is on the upper part of the side slopes, and the Hickory soil is on the lower part. Individual areas are irregular in shape and range from 15 to 90 acres is size. They are 50 to 60 percent Fayette soil and 30 to 40 percent Hickory soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Fayette soil has a surface layer of dark brown, friable silt loam about 5 inches thick. The subsurface layer is dark yellowish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. It is yellowish brown. The upper part is friable silty clay loam, the next part is firm silty clay loam, and the lower part is firm silt loam. In some areas the lower part of the subsoil is clay loam. In other areas free carbonates are at or near the surface. In places a seasonal high water table is within 5 feet of the surface.

Typically, the Hickory soil has a surface layer of very dark grayish brown, friable loam about 6 inches thick. The subsurface layer is brown, friable loam about 3 inches thick. The subsoil is about 36 inches thick. The upper part is brown, friable loam. The next part is yellowish brown, firm clay loam. The lower part is yellowish brown, firm loam. The underlying material to a depth of 60 inches is pale brown, mottled, friable loam. In places the surface layer and subsoil contain more clay. In some areas the subsoil has free carbonates. In other areas it is silty clay loam.

Included with these soils in mapping are some areas of the moderately well drained Gosport soils. These included soils contain more clay in the subsoil than the Fayette and Hickory soils. They formed in shale residuum on the lower part of the side slopes. Also included, dominantly on north- and east-facing slopes, are areas where the slope is more than 30 percent. These steeper areas are poorly suited to pasture. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Fayette and Hickory soils at a moderate rate. Surface runoff is very rapid.

Available water capacity is high. Organic matter content is moderately low. Because of local liming practices, reaction is slightly acid in the surface layer of the Fayette soil and neutral in the surface layer of the Hickory soil. The subsoil of the Fayette soil is strongly acid in the upper part and neutral in the lower part. That of the Hickory soil is strongly acid in the upper part and slightly acid in the lower part. The shrink-swell potential is moderate in the subsoil of both soils. The potential for frost action is high in the Fayette soil and moderate in the Hickory soil.

Most areas are wooded. Some are used for pasture. These soils are well suited to woodland and moderately suited to pasture. They generally are unsuited to dwellings and septic tank absorption fields because of the steep slope.

A permanent cover of pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Competing vegetation can be controlled by chemicals.

The land capability classification is VIe.

941—Virden-Piasa silt loams. These nearly level, poorly drained soils are on broad flats and in depressions on uplands (fig. 8). They are subject to ponding. Individual areas are irregular in shape and are 10 to 500 acres in size. They are 50 to 60 percent Virden soil and 30 to 40 percent Piasa soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Virden soil has a surface layer of very dark gray, friable silt loam about 8 inches thick. The subsurface layer is very dark gray, firm silty clay loam about 6 inches thick. The subsoil extends to a depth of about 60 inches. The upper part is dark gray, grayish brown, and gray, mottled, firm silty clay loam. The lower part is light olive gray, mottled, friable silt loam. In some area the soil has a thinner dark surface layer and a light colored subsurface layer. In other areas the dark surface layer is thicker. In some places the subsoil contains less clay. In other places the depth to a seasonal high water table is more than 2 feet.

Typically, the Piasa soil has a surface layer of very dark gray, friable silt loam about 8 inches thick. The subsurface layer also is very dark gray, friable silt loam. It is about 4 inches thick. The subsoil is mottled, firm silty clay loam about 43 inches thick. It has a high content of sodium. The upper part is dark grayish brown, and the lower part is olive gray and light olive gray. The underlying material to a depth of 60 inches is olive gray, mottled, friable silt loam. In some areas the surface layer is lighter in color. In other areas it is silty clay loam. In places the depth to a perched seasonal high water table is more than 2 feet.

Included with these soils in mapping are small areas of the moderately well drained Harrison soils on knolls and ridges. These included soils make up 5 to 10 percent of the unit.

Water and air move through the Virden soil at a moderately slow rate and through the Piasa soil at a very slow rate. Surface runoff is very slow or ponded on both soils. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through June in most years. It is perched on the subsoil of the Piasa soil. Available water capacity is high in the Virden soil and moderate in the Piasa soil. Organic matter content is high in the Virden soil and moderate in the Piasa soil. Reaction is neutral in the surface layer of both soils. The subsoil of the Virden soil is slightly acid or neutral, and that of the Piasa soil is mildly alkaline or moderately alkaline. The shrink-swell potential is high in the subsoil of both soils. The potential for frost action is high. The surface layer is friable and can be easily tilled when moist.

Most areas are used for soybeans, corn, or wheat. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields. The Piasa soil is well suited to sewage lagoons.

The seasonal wetness is a limitation in the areas used for cultivated crops. A combination of random subsurface drains and surface inlets or of shallow ditches and outlets reduces the wetness of the Virden soil. Narrowly spaced subsurface drains are needed in the Piasa soil. The high content of sodium in the subsoil of this soil may cause silting in the tile lines. Also, it causes moisture stress during dry periods and reduces the availability of some plant nutrients. A system of conservation tillage that returns crop residue to the soil improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Installing subsurface drains around the footings helps to lower the

Figure 8.—An area of Virden-Piasa silt loams. The light colored Piasa soil is in the foreground, and the darker Virden soil is in the background.

water table. Diverting surface water and raising the foundations above the water table by adding fill material also help to overcome the wetness. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The ponding and the moderately slow or very slow permeability are severe limitations on sites for septic tank absorption fields. Enlarging the absorption area or installing a buried or recirculating sand filter helps to overcome the moderately slow or very slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

962E2—Sylvan-Bold silt loams, 15 to 20 percent slopes, eroded. These moderately steep, well drained soils are on side slopes on highly dissected uplands. The Bold soil is calcareous. Individual areas are irregular in shape and are 10 to 50 acres in size. They are 50 to 60 percent Sylvan soil and 30 to 40 percent Bold soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Sylvan soil has a surface layer of brown, friable silt loam about 8 inches thick. The subsoil is about 22 inches thick. The upper part is dark yellowish brown and yellowish brown, firm silty clay loam. The lower part is yellowish brown, friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, very friable, calcareous silt loam. In some areas the depth to carbonates is more than 35 inches.

Typically, the Bold soil has a surface layer of brown silt loam about 6 inches thick. The subsurface layer is light brownish gray, calcareous silt loam about 6 inches thick. The underlying material to a depth of 60 inches is light brownish gray, very friable, calcareous silt loam.

Included with these soils in mapping are small areas of the well drained Raddle and Worthen soils on foot slopes. These included soils are subject to siltation. They make up 5 to 10 percent of the unit.

Water and air move through the Sylvan and Bold soils at a moderate rate. Surface runoff is rapid. Available water capacity is very high. Organic matter content is moderately low. Reaction is medium acid in the surface layer of the Sylvan soil and medium acid to neutral in the subsoil. It is mildly alkaline in the surface layer of the Bold soil and mildly alkaline or moderately alkaline below the surface layer. The shrink-swell potential is moderate

in the subsoil of the Sylvan soil. The potential for frost action is high in both soils.

Most areas are used for hay and pasture. These soils are unsuited to cultivated crops. They are moderately suited to woodland and pasture. They are poorly suited to dwellings and septic tank absorption fields.

A permanent cover of pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type and should be established on the contour if possible. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Competing vegetation can be controlled by chemicals.

The slope is a limitation on sites for dwellings. It can be overcome by cutting and filling. Compacting the fill and extending the footings in fill areas into undisturbed soil improve stability. Diverting runoff from the higher areas helps to prevent structural damage.

The slope is a limitation on sites for septic tank absorption fields. The effluent may seep laterally and surface at the lower part of the slopes. Installing the filter lines on the contour helps to overcome this limitation.

The land capability classification is VIe.

962F—Sylvan-Bold silt loams, 20 to 30 percent slopes. These steep, well drained soils are on side slopes in the highly dissected uplands (fig. 9). The Bold soil is calcareous. Individual areas are irregular in shape and are 50 to 200 acres in size. They are 50 to 60 percent Sylvan soil and 30 to 40 percent Bold soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Sylvan soil has a surface layer of very dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 21 inches thick. The upper part is yellowish brown, firm silty clay loam. The lower part is yellowish brown, friable silt loam. The underlying material to a depth of 60 inches is light olive brown, very friable, calcareous silt loam. In some areas the depth to carbonates is more than 35 inches. In other areas the slope is more than 30 percent.

Typically, the Bold soil has a surface layer of very dark grayish brown, friable silt loam about 5 inches thick. The next layer is brown, friable, calcareous silt loam about 7 inches thick. The underlying material to a depth of 60

Figure 9.—An area of Sylvan-Bold silt loams, 20 to 30 percent slopes, on bluffs along the Mississippi River.

inches is yellowish brown, very friable, calcareous silt loam. In some areas the slope is more than 30 percent.

Included with these soils in mapping are small areas of the well drained Raddle and Worthen soils on foot slopes that are subject to siltation. These included soils make up 5 to 10 percent of the unit.

Water and air move through the Sylvan and Bold soils at a moderate rate. Surface runoff is very rapid. Available water capacity is very high. Organic matter content is moderately low. The surface layer of the Sylvan soil is medium acid, and that of the Bold soil is mildly alkaline. The subsoil of the Sylvan soil is medium acid to neutral. Reaction below the surface layer of the Bold soil is mildly alkaline or moderately alkaline. The shrink-swell potential is moderate in the subsoil of the Sylvan soil. The potential for frost action is high in both soils.

Most areas are wooded. Some are used as pasture. These soils are moderately suited to woodland and pasture. They are generally unsuited to dwellings and septic tank absorption fields because of the steep slope.

A permanent cover of pasture plants helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming established. Good pasture management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type and should be established on the contour if possible. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than typical, or by mulching. Some replanting may be needed. Competing vegetation can be controlled by chemicals.

The land capability classification is VIe.

967F—Hickory-Gosport silt loams, 15 to 30 percent slopes. These steep soils are on side slopes. The well drained, deep Hickory soil generally is on the upper part of the side slopes, and the moderately well drained, moderately deep Gosport soil is on the lower part. Individual areas are irregular in shape and range from 5 to 40 acres in size. They are 50 to 60 percent Hickory soil and 30 to 40 percent Gosport soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Hickory soil has a surface layer of dark brown, friable silt loam about 6 inches thick. The subsurface layer is dark yellowish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown, firm silt loam. The lower part is yellowish brown and light brownish gray, firm clay loam. In some areas the subsoil is silty clay loam. In other areas the lower part of the subsoil contains more clay. In some places the soil is calcareous at or near the surface. In other places, the slope is less than 15 percent and a seasonal high water table is within a depth of 6 feet. In some areas, dominantly on the north- and east-facing slopes, the slope is more than 30 percent.

Typically, the Gosport soil has a surface layer of dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is yellowish brown, friable silty clay loam about 4 inches thick. The subsoil is mottled, firm silty clay about 23 inches thick. The upper part is strong brown and yellowish brown, and the lower part is grayish brown. Light brown and reddish brown, weathered shale interbedded with siltstone and sandstone is at a depth of about 32 inches. In some areas the upper part of the subsoil contains more sand and less clay. In other areas clayey shale is at a depth of more than 40 inches. In places, dominantly on north- and east-facing slopes, the slope is more than 30 percent.

Included with these soils in mapping are small areas of the somewhat poorly drained Wakeland soils, which formed in the silty alluvium on narrow bottom land. These included soils make up 5 to 10 percent of the unit.

Water and air move through the Hickory soil at a moderate rate and through the Gosport soil at a very slow rate. Surface runoff is very rapid on both soils. Available water capacity is high in the Hickory soil and moderate in the Gosport soil. Organic matter content is moderately low in the Hickory soil and high in the Gosport soil. Reaction in the surface layer of both soils is neutral because of local liming practices. The subsoil is very strongly acid. The shrink-swell potential is moderate in the subsoil of the Hickory soil and high in the subsoil of the Gosport soil. The potential for frost action is moderate in both soils.

Most areas are wooded. Some are used for pasture. These soils are moderately suited to woodland and pasture. They are generally unsuited to dwellings and septic tank absorption fields because of the slope of both soils and the shrink-swell potential, very slow permeability, and depth to bedrock in the Gosport soil.

A permanent cover of pasture plants helps to maintain or improve tilth and helps to control erosion. Planting with a no-till seeder helps to control erosion during periods when the grasses and legumes are becoming

established. Good pasture management improves the quality of the forage and keeps the soil in good condition. This management includes applications of fertilizer, weed control, pasture rotation, a proper stocking rate, and timely deferment of grazing.

In the areas used as woodland, protection from fire and grazing is essential. Logging roads and skid trails should be established on the contour if possible. Logs or trees can be skidded uphill with a cable and winch. Water bars can divert surface water from logging roads and skid trails. Firebreaks should be the grass type and should be established on the contour if possible. Bare areas created by logging operations can be seeded to grass or to a grass-legume mixture. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. When trees are planted in bare areas, a grass cover should be established between the rows. Also, the trees should be planted on the contour if a mechanical tree planter is used. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The land capability classification is VIIe.

993—Cowden-Piasa silt loams. These nearly level, poorly drained soils are on broad flats and in depressions on uplands. They are subject to ponding. Individual areas are irregular in shape and range from 10 to 200 acres in size. They are 50 to 60 percent Cowden soil and 30 to 40 percent Piasa soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Cowden soil has a surface layer of very dark gray, friable silt loam about 8 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark grayish brown, mottled, very firm silty clay loam. The next part is dark grayish brown, mottled, very firm silty clay. The lower part is light brownish gray, mottled, firm and friable silty clay loam. In some areas the dark surface layer is thicker. In other areas the subsoil contains less clay. In places the depth to a seasonal high water table is more than 2 feet.

Typically, the Piasa soil has a surface layer of very dark grayish brown, very friable silt loam about 9 inches thick. The subsurface layer is grayish brown, mottled, very friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. It has a high content of sodium. The upper part is grayish brown, mottled, very firm silty clay. The lower part is light brownish gray and light olive gray, mottled, very firm and firm silty clay loam. In some areas, the dark surface layer is thicker and the light colored subsurface layer does not occur. In other areas the surface layer is lighter in color. In places the depth to a perched seasonal high water table is more than 2 feet.

Water and air move through the Cowden soil at a slow rate and through the Piasa soil at a very slow rate. Surface runoff is very slow or ponded on both soils. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below during the period March through May in most years. It is perched on the subsoil of the Piasa soil. Available water capacity is high in the Cowden soil and moderate in the Piasa soil. Organic matter content is moderate in both soils. Reaction in the surface layer is neutral. The subsoil of the Cowden soil is slightly acid or neutral, and that of the Piasa soil is moderately alkaline or strongly alkaline. The shrink-swell potential is high in the subsoil of both soils. The potential for frost action is high.

Most areas are used for soybeans, corn, or wheat. These soils are moderately suited to cultivated crops and to hay and pasture. They are poorly suited to dwellings and septic tank absorption fields. They are well suited to sewage lagoons.

The seasonal wetness of both soils and the content of sodium in the Piasa soil are limitations in the areas used for cultivated crops. A combination of narrowly spaced subsurface drains and surface inlets or of shallow ditches and outlets improves drainage. The high content of sodium in the subsoil of the Piasa soil may cause silting in the tile lines. Also, it causes moisture stress during dry periods and limits the availability and uptake of some plant nutrients. A system of conservation tillage that returns crop residue to the soil improves tilth, water infiltration, and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods.

If these soils are used for hay and pasture, the wetness and the content of sodium are limitations. Good pasture and hayland management improves the quality and quantity of the forage and keeps the soil in good condition. This management includes a drainage system, applications of fertilizer, weed control, pasture rotation, a proper stocking rate, timely harvesting, and timely deferment of grazing.

The ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundation above the water table by adding fill material also help to overcome the wetness. Backfilling with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The ponding and the slow or very slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the slow or very slow permeability. Subsurface drains help to lower the water table. Diverting surface

water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

995—Herrick-Piasa silt loams. These nearly level soils are on broad flats and slight rises in the uplands. The Herrick soil is somewhat poorly drained. The Piasa soil is poorly drained. It is subject to ponding. Individual areas are irregular in shape and range from 5 to 200 acres in size. They are 50 to 60 percent Herrick soil and 30 to 40 percent Piasa soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Herrick soil has a surface layer of very dark grayish brown, friable silt loam about 12 inches thick. The subsurface layer is dark grayish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, friable silty clay loam. The lower part is yellowish brown and light yellowish brown, mottled, firm silty clay loam. In some areas the surface layer is thinner or lighter in color. In other areas the subsoil contains less clay. In some places, the surface layer is thicker and the light colored subsurface horizon does not occur. In other places a seasonal high water table is more than 3 feet below the surface.

Typically, the Piasa soil has a surface layer of very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is very dark grayish brown and grayish brown, friable silt loam about 9 inches thick. The subsoil to a depth of 60 inches is grayish brown, mottled, firm and very firm silty clay loam. It has a high content of sodium. In some areas the surface layer is lighter colored. In other areas the light colored subsurface layer does not occur. In some places a seasonal high water table is more than 2 feet below the surface. In other places the subsoil contains less clay.

Included with these soils in mapping are small areas of the poorly drained Cowden soils in slight depressions. These included soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Herrick soil at a moderately slow rate and through the Piasa soil at a very slow rate. Surface runoff is slow on the Herrick soil and very slow or ponded on the Piasa soil. The Herrick soil has a seasonal high water table 1 to 3 feet below the surface from March through June in most years. The Piasa soil has a perched seasonal high water table 0.5 foot above the surface to 2.0 feet below during the period March through May in most years. Available water capacity is high in the Herrick soil and moderate in the Piasa soil. Organic matter content also is high in the Herrick soil and moderate in the Piasa soil. Reaction is medium acid in the surface layer of the Herrick soil and slightly acid to strongly acid in the subsoil. It is neutral in the surface layer of the Piasa soil and mildly alkaline or moderately alkaline in the subsoil. The shrink-swell potential is high in the subsoil of both soils. The potential for frost action is high.

Most areas are used for corn, soybeans, or wheat. Some are used as sites for dwellings and septic tank absorption fields. These soils are moderately suited to cultivated crops. They are poorly suited to dwellings and septic tank absorption fields. The Piasa soil is well suited to sewage lagoons.

The seasonal wetness of both soils and the content of sodium in the Piasa soil are limitations in the areas used for cultivated crops. A combination of random subsurface drains and surface inlets or of shallow ditches and outlets improves drainage. Subsurface drains in the Piasa soil should be narrowly spaced. The high content of sodium in the subsoil of this soil may cause silting in the tile lines. Also, it causes moisture stress and limits availability and uptake of some plant nutrients. Returning crop residue to the soils and regularly adding other organic material increase the rate of water infiltration and improve tilth and fertility. Tilling when the soil is wet causes surface compaction and the formation of clods.

The seasonal wetness or ponding and the high shrink-swell potential are severe limitations on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table. Reinforcing footings and foundations and backfilling with sand and gravel around the footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness or ponding and the very slow or moderately slow permeability are severe limitations on sites for septic tank absorption fields. A buried or recirculating sand filter helps to overcome the very slow or moderately slow permeability. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIw.

1070—Beaucoup silty clay loam, wet. This nearly level, very poorly drained soil is in marshes and swamps on flood plains. It is ponded from November through July. Levees generally provide protection against overflow from the Mississippi River, but the soil is occasionally flooded for brief periods in the spring. Individual areas are oval or long and narrow and range from 20 to 100 acres in size.

Typically, the surface layer is very dark gray, firm silty clay loam about 11 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark gray, mottled, firm silty clay loam. The next part is dark gray, mottled, friable silt loam. The lower part is dark gray, mottled, friable silty clay loam. In some areas the surface layer is thinner and lighter in color. In other areas the soil is underlain by loamy fine sand.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki, Tice, and Riley soils on the higher parts of the flood plains. These soils

are not subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from November through July in most years. Available water capacity is very high. Organic matter content is high. Reaction in the surface layer is neutral. The subsoil is neutral or mildly alkaline. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are left idle and support cattails and water-tolerant sedges, grasses, and weeds. Some areas are covered with trees and brush. This soil is not drained because drainage outlets are not available. It is in natural storage areas for runoff. The dominant vegetation in the forested areas is cottonwoods and willows. The soil is well suited to wetland wildlife habitat. It is unsuited to cultivated crops, hay, pasture, dwellings, and septic tank absorption fields because of the seasonal ponding.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

Maintaining or improving the habitat is a management concern if this soil is used for wetland wildlife habitat. Unwanted vegetation can be controlled by mowing and cutting during dry periods. Protection from fire and grazing improves the habitat. Maintaining seed-bearing, water-tolerant plants provides food for wildlife.

The land capability classification is Vw.

1071—Darwin silty clay, wet. This nearly level, very poorly drained soil is in marshes and swamps on flood plains. It is ponded from November through July. Levees generally provide protection against overflow from the Mississippi River, but the soil is occasionally flooded for long periods in winter and spring. Individual areas are long and range from 20 to 150 acres in size.

Typically, the surface layer is very dark gray, firm silty clay about 8 inches thick. The subsurface layer is very dark gray, very firm silty clay about 9 inches thick. The subsoil to a depth of 60 inches is dark grayish brown and dark gray, mottled, very firm silty clay. In some areas the soil is silty clay loam throughout. In other areas the surface layer is thinner and lighter in color. In some places the lower part of the subsoil is loam or very fine sandy loam. In other places the dark surface layer is thicker.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki and Tice soils on the higher parts of the flood plains. These soils are not subject to ponding. They make up 5 to 10 percent of the unit.

Water and air move through the Darwin soil at a very slow rate. Surface runoff is ponded. A seasonal high water table is 1 foot above the surface to 2 feet below during the period November through July in most years. Available water capacity is moderate. Organic matter content also is moderate. The surface layer is slightly acid. The subsoil is slightly acid or neutral. It has a very high shrink-swell potential. The potential for frost action is moderate.

Most areas are left idle and support cattails and water-tolerant sedges, grasses, and weeds. Some areas are covered with trees and brush. This soil is not drained because drainage outlets are not available. It is in natural storage areas for runoff. The dominant vegetation in the forested areas is cottonwoods and willows. The soil is well suited to wetland wildlife habitat. It is generally unsuited to cultivated crops, hay, pasture, dwellings, and septic tank absorption fields because of the seasonal ponding.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

Maintaining or improving the habitat is a management concern if this soil is used for wetland wildlife habitat. Unwanted vegetation can be controlled by mowing and cutting during dry periods. Protection from fire and grazing improves the habitat. Maintaining seed-bearing, water-tolerant plants provides food for wildlife.

The land capability classification is Vw.

2041B—Muscatine-Urban land complex, 1 to 4 percent slopes. This map unit occurs as areas of a gently sloping, somewhat poorly drained Muscatine soil intermingled with areas of Urban land. It is on broad upland flats and knolls. Individual areas range from 25 to 100 acres in size. They are 50 to 60 percent Muscatine soil and 30 to 40 percent Urban land. The Muscatine soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Muscatine soil has a surface layer of very dark grayish brown, friable silt loam about 18 inches thick. The subsoil is mottled, firm silty clay loam about 30 inches thick. The upper part is brown, and the lower part is light yellowish brown. The underlying material to a

depth of 60 inches is light brownish gray, mottled, friable silt loam. In some areas the soil has been altered by leveling, cutting, and filling. In other areas a seasonal high water table is more than 4 feet below the surface.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Virden and Sable soils in slight depressions. These soils are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Muscatine soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 2 to 4 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content also is high. Reaction is neutral in the surface layer. The subsoil is slightly acid to strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

The Muscatine soil is used for parks, building site development, lawns, and gardens. It is moderately suited to dwellings without basements and poorly suited to dwellings with basements and to septic tank absorption fields. It is moderately suited to recreational development and well suited to lawns and gardens.

Grasses, flowers, vegetables, trees, and shrubs grow well on the Muscatine soil. In areas where the soil is disturbed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The seasonal wetness is a severe limitation on sites for dwellings with basements. The shrink-swell potential and the seasonal wetness are limitations on sites for dwellings without basements. Installing subsurface drains around the foundation helps to lower the water table. Reinforcing footings and foundations and backfilling excavations with sand and gravel help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness is a severe limitation on sites for septic tank absorption fields. Public sewer connections are generally available. Installing subsurface drains helps to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

The seasonal wetness and the slope limit some recreational uses. Subsurface drains and diversions reduce the wetness in picnic areas and on playgrounds. Special surfacing also helps to overcome the wetness. Grading sites for playgrounds helps to overcome the slope. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2071—Darwin-Urban land complex. This map unit occurs as areas of a nearly level, poorly drained Darwin soil intermingled with areas of Urban land. It is on the flood plains along the Mississippi River. The Darwin soil is subject to ponding. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are 30 to 160 acres in size. They are 50 to 60 percent Darwin soil and 30 to 40 percent Urban land. The Darwin soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Darwin soil has a surface layer of very dark gray, mottled, very firm silty clay about 14 inches thick. The subsoil to a depth of 60 inches is mottled, very firm silty clay. The upper part is dark gray, and the lower part is gray. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the somewhat poorly drained Nameoki and Tice soils on the slightly higher parts of the flood plains. These soils are not subject to ponding. Also included, near drainageways, are a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Darwin soil at a very slow rate. Surface runoff is very slow or ponded. A seasonal high water table is 1 foot above the surface to 2 feet below from March through June in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer and subsoil is neutral. The shrink-swell potential is very high in the subsoil. The potential for frost action is moderate.

The Darwin soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings, recreational development, and lawns and gardens. It is generally unsuited to septic tank absorption fields.

The seasonal wetness is a severe limitation in the areas used for parks and lawns. The plant species that can withstand long periods of wetness should be selected for planting. Surface drains reduce the wetness.

The flooding, the ponding, and the shrink-swell potential are limitations on sites for dwellings. A levee system reduces the flooding hazard. Raising the ground level above the water table by adding fill material and installing surface drains help to overcome the ponding. Backfilling with sand and gravel around the foundation and reinforcing the foundation help to prevent the structural damage caused by shrinking and swelling.

This map unit is not assigned to a land capability classification.

2113B—Oconee-Urban land complex, 1 to 4 percent slopes. This map unit occurs as areas of a gently sloping, somewhat poorly drained Oconee soil

intermingled with areas of Urban land. It is on upland knolls and ridges. Individual areas range from 25 to 100 acres in size. They are 50 to 60 percent Oconee soil and 30 to 40 percent Urban land. The Oconee soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Oconee soil has a surface layer of very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 13 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, mottled, firm silty clay loam. The next part is grayish brown, mottled, very firm silty clay and silty clay loam. The lower part is light brownish gray, mottled, firm silty clay loam. In some areas the soil has been altered by leveling, cutting, and filling. In other areas a seasonal high water table is within 1 foot of the surface.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Piasa soils, which contain sodium. These soils are in slight depressions and are subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Oconee soil at a slow rate. Surface runoff is medium. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer varies because of local liming practices but commonly is slightly acid. The subsoil is strongly acid or medium acid. It has a high shrink-swell potential. The potential for frost action is high.

The Oconee soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings and septic tank absorption fields. It is moderately suited to recreational development, lawns and gardens, and sewage lagoons.

Grasses, flowers, vegetables, trees, and shrubs grow well on the Oconee soil if fertility is maintained. Perennial species that can withstand the wetness should be selected for planting. In areas where the soil has been disturbed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The seasonal wetness and the high shrink-swell potential are severe limitations on sites for dwellings. Installing subsurface drains around the foundation helps to lower the water table. Reinforcing footings and foundations and backfilling around the footings and foundations with sand and gravel help to prevent the structural damage caused by shrinking and swelling.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. Where commercial sewer connections are not available, a buried or recirculating sand filter should be installed to overcome the slow permeability. Subsurface drains help to lower the water table. Diverting surface water from the filter bed keeps the system functioning properly. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

Because of the seasonal wetness, special surfacing may be needed in recreational areas, such as walkways in parks and playgrounds. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2122B—Colp-Urban land complex, 1 to 5 percent slopes. This map unit occurs as areas of a gently sloping, moderately well drained Colp soil intermingled with areas of Urban land. It is on terraces. Individual areas are 10 to 60 acres in size. They are 50 to 60 percent Colp soil and 30 to 40 percent Urban land. The Colp soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Colp soil has a surface layer of very dark grayish brown, friable silt loam about 4 inches thick. The subsurface layer is brown, friable silt loam about 11 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, firm and very firm silty clay loam and silty clay. The next part is stratified yellowish red and yellowish brown, very firm silty clay. The lower part is yellowish brown, mottled, firm silty clay loam and silt loam. In some area the soil has been altered by leveling, cutting, and filling. In other areas the subsoil contains less clay. In places a seasonal high water table is within 2 feet of the surface.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Water and air move through the Colp soil at a slow rate. Surface runoff is medium. A seasonal high water table is 2 to 4 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is very strongly acid or strongly acid. It has a high shrink-swell potential. The potential for frost action is high.

The Colp soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings and septic tank absorption fields. It is moderately suited to recreational development and sewage lagoons and well suited to lawns and gardens.

Grasses, flowers, vegetables, trees, and shrubs grow well on the Colp soil if fertility is maintained. In areas where the soil is disturbed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The high shrink-swell potential and the seasonal wetness are limitations on sites for dwellings. Backfilling

with sand and gravel and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundation and diverting surface water reduce the wetness.

The seasonal wetness and the slow permeability are severe limitations on sites for septic tank absorption fields. The slow permeability can be overcome by mounding and by installing a buried or recirculating sand filter. Subsurface drains help to lower the water table. Diverting surface water from the filter bed keeps the system functioning properly. The slope is a limitation on sites for sewage lagoons. It can be altered during construction.

Because of the seasonal wetness, special surfacing may be needed in recreational areas, such as walkways in parks and playgrounds. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2279B—Rozetta-Urban land complex, 2 to 8 percent slopes. This map unit occurs as areas of a gently sloping and moderately sloping, moderately well drained Rozetta soil intermingled with areas of Urban land. It is on ridgetops. Individual areas range from 20 to 260 acres in size. They are 50 to 60 percent Rozetta soil and 30 to 40 percent Urban land. The Rozetta soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Rozetta soil has a surface layer of dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is dark yellowish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches. The upper part is brown, friable and firm silt loam. The lower part is dark yellowish brown, mottled, firm silty clay loam. In places the soil has been altered by leveling, cutting, and filling. In some areas a seasonal high water table is within 4 feet of the surface. In other areas it is more than 6 feet below the surface.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Water and air move through the Rozetta soil at a moderate rate. Surface runoff is medium. A seasonal high water table is 4 to 6 feet below the surface during the period April through June in most years. Available water capacity is low. Organic matter content is moderately low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is medium acid to strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

The Rozetta soil is used for parks, building site development, lawns, and gardens. It is moderately suited to dwellings, septic tank absorption fields, and recreational development. It is well suited to lawns and gardens.

Grasses, flowers, vegetables, trees, and shrubs grow well on the Rozetta soil if fertility is maintained. In areas where the soil is disturbed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The shrink-swell potential is a limitation on sites for dwellings. The seasonal wetness also is a limitation on sites for dwellings with basements. Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling. Installing subsurface drains around the foundations of dwellings with basements helps to lower the water table.

The seasonal wetness and the moderate permeability are limitations on sites for septic tank absorption fields. Where public sewer connections are not available, a buried or recirculating sand filter should be installed to overcome the moderate permeability. Subsurface drains help to lower the water table.

The slope is a limitation on sites used for parks and playgrounds. Cutting and filling are needed on some sites. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2280D—Fayette-Urban land complex, 8 to 15 percent slopes. This map unit occurs as areas of a strongly sloping, well drained Fayette soil intermingled with areas of Urban land. It is on side slopes. Individual areas range from 20 to 80 acres in size. They are 50 to 60 percent Fayette soil and 30 to 40 percent Urban land. The Fayette soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Fayette soil has a surface layer of very dark grayish brown, very friable silt loam about 4 inches thick. The subsurface layer is dark brown, very friable silt loam about 8 inches thick. The subsoil extends to a depth of 60 inches. The upper part is yellowish brown and dark yellowish brown, friable silt loam. The lower part is yellowish brown, firm silty clay loam. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the somewhat poorly drained Wakeland soils on stream bottoms. These soils make up less than 5 percent of the unit.

Water and air move through the Fayette soil at a moderate rate. Surface runoff is rapid. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer is neutral because of

local liming practices. The subsoil is neutral to strongly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

The Fayette soil is used for parks, building site development, lawns, and gardens. It is moderately suited to dwellings, lawns and gardens, and septic tank absorption fields and poorly suited to recreational development.

Grasses, flowers, vegetables, trees, and shrubs grow well on the Fayette soil if fertility is maintained. In areas where the soil is distributed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The shrink-swell potential and the slope are limitations on sites for dwellings. Constructing benches by cutting and filling helps to overcome the slope. Compacting the fill and extending the footings in fill areas into the undisturbed soil improve stability. Diverting runoff from higher areas and reinforcing footings and foundations help to prevent the structural damage caused by shrinking and swelling.

The slope is a limitation on sites for septic tank absorption fields. Installing a series of absorption trenches on the contour helps to overcome this limitation. Separate filling of the individual trenches can be achieved by using a distribution box or by installing a serial distribution system.

The slope is a severe limitation on sites for parks and playgrounds. Cutting and filling are needed on some sites. Onsite investigation is essential to evaluate and plant the development of the sites.

This map unit is not assigned to a land capability classification.

2284—Tice-Urban land complex. This map unit occurs as areas of a nearly level, somewhat poorly drained Tice soil intermingled with areas of Urban land. It is on flood plains. Levees generally provide protection against overflow from the Mississippi River, but the unit is subject to rare flooding. Individual areas are 40 to 120 acres in size. They are 50 to 60 percent Tice soil and 30 to 40 percent Urban land. The Tice soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Tice soil has a surface layer of very dark grayish brown, firm silt loam about 11 inches thick. The subsoil is about 45 inches thick. The upper part is dark grayish brown and brown, mottled, firm silty clay loam. The lower part is grayish brown and light brownish gray, mottled, firm and friable silt loam. The underlying material to a depth of 60 inches is light brownish gray, mottled, very friable silt loam that has strata of firm silty clay loam. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Beaucoup and Darwin soils in slight depressions. These soils are subject to ponding. They make up 10 to 15 percent of the unit. Also included, near drainageways, are a few small areas where local flooding is more frequent.

Water and air move through the Tice soil at a moderate rate. A seasonal high water table is 1.5 to 3.0 feet below the surface from March through June in most years. Surface runoff is slow. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer is neutral because of past liming practices. The subsoil is slightly acid or neutral. It has a moderate shrink-swell potential. The potential for frost action is high.

The Tice soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings, septic tank absorption fields, and some recreational facilities. It is moderately suited to lawns and gardens.

Grasses, vegetables, flowers, trees, and shrubs grow well on the Tice soil if fertility is maintained. Perennial species that can withstand the wetness should be selected for planting.

The seasonal wetness and the flooding are severe limitations on sites for dwellings. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness. An extensive system of levees reduces the frequency of flooding.

The wetness is a severe limitation on sites for septic tank absorption fields. Subsurface drains help to lower the water table. Diverting surface water away from the filter bed keeps the system functioning properly.

Because of the seasonal wetness, special surfacing may be needed in recreational areas, such as walkways in parks and playgrounds. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2304B—Landes-Urban land complex, 0 to 5 percent slopes. This map unit occurs as areas of a nearly level and gently sloping, well drained Landes soil intermingled with areas of Urban land. It is on ridges on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the unit is subject to rare flooding. Individual areas are 15 to 60 acres in size. They are 50 to 60 percent Landes soil and 30 to 40 percent Urban land. The Landes soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Landes soil has a surface layer of very dark grayish brown, very friable very fine sandy loam about 15 inches thick. The subsoil is yellowish brown, very friable, very fine sandy loam about 22 inches thick. The underlying material to a depth of 60 inches is yellowish brown and olive brown, loose loamy fine sand. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Beaucoup and McFain soils in slight depressions. Also included are a few small areas near drainageways where local flooding is more frequent and areas of the somewhat poorly drained Nameoki and Riley soils in swales. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Landes soil at a moderately rapid rate and through the lower part at a rapid rate. Surface runoff is slow. Available water capacity is moderate. Organic matter content is moderately low. Reaction in the surface layer and subsoil is neutral. The potential for frost action is moderate.

The Landes soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings and septic tank absorption fields. It is well suited to recreational development and moderately suited to lawns and gardens.

Drought is a hazard in the areas used for grasses, vegetables, flowers, trees, and shrubs. Providing additional water helps to establish and maintain the plants. In areas where the soil has been disturbed by grading, erosion is a hazard. It can be controlled by seeding grass and applying mulch.

The flooding is a hazard on sites for dwellings. An extensive system of levees, however, generally reduces the hazard of flooding.

Because of the rapid permeability, ground-water pollution is a hazard if standard septic tank absorption fields are installed in the Landes soil. A sealed sand filter and a disinfection tank help to prevent this pollution.

This map unit is not assigned to a land capability classification.

2452A—Riley-Urban land complex, 0 to 3 percent slopes. This map unit occurs as areas of a nearly level, somewhat poorly drained Riley soil intermingled with areas of Urban land. It is on low stream terraces. Levees generally provide protection against overflow from the Mississippi River, but the unit is subject to rare flooding. Individual areas are 40 to 170 acres in size. They are 50 to 60 percent Riley soil and 30 to 40 percent Urban land. The Riley soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Riley soil has a surface layer of very dark grayish brown, firm loam about 9 inches thick. The subsurface layer is very dark gray, firm clay loam about 5 inches thick. The subsoil is about 30 inches thick. The upper part is dark grayish brown, mottled, firm clay loam. The next part is brown, mottled, friable fine sandy loam. The lower part is dark yellowish brown, mottled, friable very fine sandy loam. The underlying material to a depth of 60 inches is yellowish brown, mottled, loose sand. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Beaucoup and Darwin soils in swales and depressions. These soils are subject to ponding. Also included are the well drained Landes soil on the slightly higher ridges and, near drainageways, a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Riley soil at a moderate rate and through the lower part at a rapid rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface from April through June in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the surface layer varies because of local liming practices but commonly is medium acid. The subsoil is slightly acid or neutral. It has a moderate shrink-swell potential. The potential for frost action is high.

The Riley soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings, septic tank absorption fields, and recreational development. It is moderately suited to lawns and gardens.

Drought is a hazard in the areas used for grasses, vegetables, flowers, trees, and shrubs. Providing additional water helps to maintain plant growth late in summer.

The flooding and the seasonal wetness are severe limitations on sites for dwellings. An extensive system of levees reduces the hazard of flooding. Installing subsurface drains around the footings helps to lower the water table. Diverting surface water and raising the foundations of buildings without basements above the seasonal high water table by adding fill material also help to overcome the wetness.

Because of the rapid permeability, ground-water pollution is a hazard if standard septic tank absorption fields are installed in the Riley soil. Also, the wetness is a severe limitation. A sealed sand filter and a disinfection tank help to prevent pollution of ground water. Diverting

surface water away from the filter bed keeps the system functioning properly.

Because of the seasonal wetness, special surfacing may be needed in recreational areas, such as walkways in parks and playgrounds. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2592A—Nameoki-Urban land complex, 0 to 3 percent slopes. This map unit occurs as areas of a nearly level, somewhat poorly drained Nameoki soil intermingled with areas of Urban land. It is on low ridges on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the unit is subject to rare flooding. Individual areas are 20 to 200 acres in size. They are 50 to 60 percent Nameoki soil and 30 to 40 percent Urban land. The Nameoki soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Nameoki soil has a surface layer of very dark gray and very dark grayish brown, very firm silty clay loam about 12 inches thick. The subsurface layer is very dark grayish brown, very firm silty clay about 3 inches thick. The subsoil extends to a depth of 60 inches. The upper part is dark brown, mottled, very firm silty clay. The next part is yellowish brown, light olive brown, and grayish brown, mottled, firm and very firm silty clay loam. The lower part is brown and grayish brown, mottled, firm silty clay loam and silt loam. In some areas the lower part of the subsoil and the underlying material are silty clay. In other areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the poorly drained Darwin soil in slight depressions. These soils are subject to ponding. Also included are the well drained Landes soil on the slightly higher ridges and, near drainageways, a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Nameoki soil at a very slow rate and through the lower part at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer is neutral because of local liming practices. The subsoil is slightly acid to strongly acid. It has a high shrink-swell potential. The potential for frost action is high.

The Nameoki soil is used for parks, building site development, lawns, and gardens. It is poorly suited to dwellings, recreational development, and sewage lagoons and is generally unsuited to septic tank absorption fields. It is moderately suited to lawns and gardens.

Grasses, vegetables, flowers, trees, and shrubs grow well on the Nameoki soil if fertility is maintained. Perennial species that can withstand the wetness should be selected for planting.

The flooding, the seasonal wetness, and the high shrink-swell potential are severe limitations on sites for dwellings. Raising the ground level by adding fill material helps to divert surface water. Backfilling around foundations with sand and gravel, installing tile drains around the foundations, and reinforcing footings help to prevent the structural damage caused by shrinking and swelling and by wetness. An extensive system of levees reduces the frequency of flooding.

A sewage lagoon is an effective means of waste disposal if the floor of the lagoon is covered with 2 feet of slowly permeable material.

Because of the seasonal wetness, special surfacing may be needed in recreational areas, such as walkways in parks and playgrounds. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

2741B—Oakville-Urban land complex, 1 to 6 percent slopes. This map unit occurs as areas of a gently sloping, well drained Oakville soil intermingled with areas of Urban land. It is on ridges and low terraces on bottom land. Individual areas are 50 to 1,000 acres in size. They are 50 to 60 percent Oakville soil and 30 to 40 percent Urban land. The Oakville soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical.

Typically, the Oakville soil has a surface layer of dark grayish brown, loose fine sand about 6 inches thick. The subsoil is brown, loose fine sand about 12 inches thick. The underlying material to a depth of 60 inches is yellowish brown and pale brown, loose fine sand. In some areas the soil has been altered by leveling, cutting, and filling.

The Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification of the soil series is not feasible.

Included with this unit in mapping are small areas of the somewhat poorly drained Ridgeville soils in swales and the poorly drained Ambraw soils on bottom land. These soils make up 5 to 10 percent of the unit.

Water and air move through the Oakville soil at a rapid rate. Surface runoff is slow. Available water capacity is low. Organic matter content also is low. Reaction in the surface layer is neutral because of local liming practices. The subsoil is strongly acid.

The Oakville soil is used for parks, building site development, lawns, and gardens. It is well suited to dwellings and poorly suited to septic tank absorption fields. It is moderately suited to recreational development and to lawns and gardens.

Drought and low fertility are limitations in the areas used for grasses, vegetables, flowers, trees, and shrubs. Providing additional water and applying fertilizer help to establish and maintain the plants. Drought-resistant species should be selected for planting.

Because of the rapid permeability, ground-water pollution is a hazard if the Oakville soil is used as a site for septic tank absorption fields. A sealed sand filter and a disinfection tank help to prevent this pollution.

The slope is a limitation in the areas used for parks and playgrounds. It can be overcome by cutting and filling. Onsite investigation is essential to evaluate and plan the development of the sites.

This map unit is not assigned to a land capability classification.

3070—Beaucoup silty clay loam, frequently flooded. This nearly level, poorly drained soil is on bottom land outside an established system of levees. It is frequently flooded by the Mississippi River for long periods from March through June in most years. Also, it is subject to ponding. Individual areas are irregular in shape or long and narrow and are 50 to 60 acres in size.

Typically, the surface layer is very dark gray and very dark grayish brown, firm silty clay loam about 14 inches thick. The subsoil extends to a depth of 60 inches. The upper part is very dark grayish brown and dark grayish brown, mottled, firm silty clay loam that has thin strata of silt loam. The lower part is grayish brown and dark grayish brown, mottled, firm silty clay loam. In some areas the subsoil and the underlying material are very firm silty clay. In other areas the upper part of the soil is light colored, stratified silt loam and silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki and Tice soils on ridges and the slightly higher parts of the bottom land. These soils are not subject to ponding. They make up 10 to 15 percent of the unit.

Water and air move through the Beaucoup soil at a moderately slow rate. Surface runoff is very slow or ponded. A seasonal high water table is 0.5 foot above the surface to 2.0 feet below from March through June in most years. Available water capacity is very high. Organic matter content is high. Reaction in the surface layer is neutral. The subsoil is neutral or slightly acid. It has a moderate shrink-swell potential. The potential for frost action is high.

Most areas are used for soybeans. Many are wooded. This soil is poorly suited to cultivated crops and well suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the ponding.

The flooding delays planting or causes crop damage in most years. Crops that can be planted later in the growing season, such as soybeans, are less affected by flooding than early planted crops, such as corn. After the floodwater recedes, water often remains standing in swales or depressions for extended periods, further restricting crop production. Shallow ditches can help to drain ponded areas if suitable outlets are available. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and improves water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The land capability classification is IVw.

3071—Darwin silty clay, frequently flooded. This nearly level, poorly drained soil is on bottom land outside an established system of levees. It is frequently flooded by the Mississippi River for long periods from March through June in most years. Also, it is subject to ponding. Individual areas are long or irregular in shape and are 5 to 110 acres in size.

Typically, the surface layer is very dark gray, firm silty clay about 10 inches thick. The subsoil is mottled, very firm silty clay about 40 inches thick. The upper part is dark gray and gray, and the lower part is light olive brown and gray. The underlying material to a depth of 60 inches is gray and light olive brown, mottled, firm silty clay. In some areas the surface layer is thinner or lighter in color. In other areas the lower part of the subsoil is stratified loam and very fine sandy loam or loamy very fine sand. In some places light colored, silty overwash covers the surface layer. In other places the soil is silty clay loam throughout.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki and Tice soils on the slightly higher parts of the bottom land. These soils are not subject to ponding. Also included are the moderately well drained Sarpy Variant soils, which formed in sandy alluvium over silty alluvium. These soils are on the slightly higher ridges on bottom land. Included soils make up 10 to 15 percent of the unit.

Water and air move through the Darwin soil at a very slow rate. Surface runoff is very slow or ponded. A seasonal high water table is 1 foot above the surface to 2 feet below during the period March through June in most years. Available water capacity is moderate. Organic matter content also is moderate. Reaction in the

surface layer is neutral. The subsoil is neutral or mildly alkaline. Tilth is poor because the surface layer has a high content of clay and is hard and cloddy when dry. The shrink-swell potential is very high in the subsoil. The potential for frost action is moderate.

Most areas are used for soybeans. Some are wooded. This soil is poorly suited to cultivated crops and moderately suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the ponding.

The flooding delays planting or causes crop damage in most years. Crops that can be planted later in the growing season, such as soybeans, are less affected by flooding than early planted crops, such as corn. After the floodwater recedes, water often remains standing in swales or depressions for extended periods, further restricting crop production. Shallow ditches can help to drain ponded areas if suitable outlets are available. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and improves water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Operating machinery only during periods when the soil is firm enough to support the equipment helps to prevent the formation of ruts. Seedling mortality can be controlled by planting in furrows, by selecting seedlings that are larger than is typical, or by mulching. Some replanting may be needed. Harvesting methods that do not isolate the remaining trees or leave them widely spaced help to prevent windthrow. Competing vegetation can be controlled by chemicals.

The land capability classification is IVw.

3092B—Sarpy Variant loamy fine sand, frequently flooded, 0 to 6 percent slopes. This nearly level to gently sloping, moderately well drained soil is on ridges and natural levees on bottom land. It is in areas outside an established system of levees. It is frequently flooded by the Mississippi River for brief periods from March through June in most years. Individual areas are long and narrow or oval and are 10 to 50 acres in size.

Typically, the surface layer is dark brown, loose loamy fine sand about 7 inches thick. The upper part of the underlying material is light yellowish brown, loose very fine sand. The next part is light yellowish brown, mottled, slightly effervescent, very friable loamy very fine sand. The lower part to a depth of 60 inches is pale brown, mottled, slightly effervescent, very friable silt loam. In some areas the soil is stratified silt loam to a depth of 60 inches. In other areas the underlying material has thin strata of silty clay or silty clay loam. In some places the soil has a thicker surface layer and a subsoil of fine or very fine sandy loam. In other places it has an overwash surface layer of silt loam or silty clay loam.

Included with this soil in mapping are small areas of the somewhat poorly drained Nameoki soils, which have a high shrink-swell potential and are on low ridges. Also included are the poorly drained Beaucoup and Darwin soils in depressions on bottom land. These soils are subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Sarpy Variant soil at a rapid rate and through the lower part at a moderate rate. Surface runoff is slow. A seasonal high water table is 3 to 5 feet below the surface from March through May in most years. Available water capacity is moderate. Organic matter content is low. Reaction in the surface layer is neutral. The underlying material ranges from neutral to moderately alkaline. The potential for frost action is moderate.

Most areas are used for soybeans. Some are wooded. This soil is poorly suited to cultivated crops and very well suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding.

The flooding delays planting or causes crop damage in most years. Droughtiness, wind erosion, and low fertility are additional management concerns. Crops that can be planted later in the growing season, such as soybeans, are less affected by flooding than early planted crops, such as corn. Crop residue management and regular additions of other organic material improve fertility and conserve moisture. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and reduces the susceptibility to wind erosion.

In the areas used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The land capability classification is IVw.

3284—Tice silt loam, frequently flooded. This nearly level, somewhat poorly drained soil is on bottom land along small streams. It is frequently flooded for brief periods from March through June. Individual areas are irregular in shape or long and narrow and are 5 to 80 acres in size.

Typically, the surface layer is very dark grayish brown, friable silt loam about 11 inches thick. The subsoil is about 25 inches thick. The upper part is dark brown, mottled, friable silt loam. The lower part is dark brown and grayish brown, mottled, friable silty clay loam. The underlying material to a depth of 60 inches is dark grayish brown, mottled, friable silt loam. In some areas the surface layer is more than 24 inches thick. In other areas the subsoil contains more silt and less clay. In some places a seasonal high water table is within 1 foot of the surface. In other places the subsoil contains more clay.

Included with this soil in mapping are small areas of the well drained Raddle soils on ridges and foot slopes on the bottom land. These soils make up 10 to 15 percent of the unit.

Water and air move through the Tice soil at a moderate rate. Surface runoff is slow. A seasonal high water table is 1.5 to 3.0 feet below the surface from March through June in most years. Available water capacity is very high. Organic matter content is moderate. The surface layer is mildly alkaline. The subsoil is medium acid. It has a moderate shrink-swell potential. The potential for frost action is high. The surface layer is friable and can be easily tilled.

Most areas are used for soybeans or corn. Some are wooded. This soil is moderately suited to cultivated crops. It is well suited to woodland. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the seasonal wetness.

The flooding normally does not interfere with the growth of crops. Where wetness is a problem, a combination of surface ditches or subsurface drains and outlets improves drainage. Returning crop residue to the soil and regularly adding other organic material help to maintain good tilth and improve water infiltration. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration.

In the areas used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The land capability classification is IIIw.

3592A—Nameoki silty clay loam, frequently flooded, 0 to 3 percent slopes. This deep, nearly level, somewhat poorly drained soil is on low ridges on bottom land outside an established system of levees. It is frequently flooded for brief periods from March through June in most years. Individual areas are long and narrow and are 15 to 50 acres in size.

Typically, the surface layer is black and very dark gray, firm silty clay loam about 14 inches thick. The subsoil extends to a depth of 60 inches. The upper part is very dark gray, mottled, very firm silty clay. The next part is light olive brown and grayish brown, mottled, very firm and firm silty clay that has thin strata of silty clay loam. The lower part is gray, mottled, friable clay loam. In places the lower part of the subsoil and the underlying material are silty clay. In some areas the surface layer is thinner and lighter in color. In other areas it is light colored overwash of silt loam or silty clay loam. In places the soil contains less clay throughout.

Included with this soil in mapping are small areas of the moderately well drained Sarpy Variant soils, which are subject to wind erosion and are on the slightly higher ridges. Also included are the poorly drained Beaucoup and Darwin soils in swales on the bottom land. These soils are subject to ponding. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Nameoki soil at a very slow rate and through the lower part at a moderate rate. Surface runoff is slow. A seasonal high water table is 1 to 3 feet below the surface from March through June in most years. Available water capacity is high. Organic matter content is moderate. Reaction in the surface layer is neutral. The subsoil is neutral to mildly alkaline. Tilth is poor because the surface layer has a high content of clay and is hard and cloddy when dry. The shrink-swell potential is high in the subsoil. The potential for frost action is high.

Most areas are used for soybeans. This soil is moderately suited to cultivated crops. It is generally unsuited to dwellings and septic tank absorption fields because of the flooding and the seasonal wetness.

The flooding delays planting or causes crop damage in most years. Crops that can be planted later in the growing season, such as soybeans, are less affected by flooding than early planted crops, such as corn. A system of conservation tillage that returns crop residue to the soil helps to maintain tilth and improves water infiltration.

The land capability classification is IVw.

6092B—Sarpy Variant loamy fine sand, 0 to 6 percent slopes. This moderately well drained, nearly level to gently sloping soil is on ridges and natural levees on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are long and narrow or irregular in shape and are 10 to 30 acres in size.

Typically, the surface layer is dark brown, very friable loamy fine sand about 8 inches thick. The upper part of the underlying material is brown, loose loamy fine sand. The lower part to a depth of 60 inches is brown, mottled, very friable silt loam. In some areas the lower part of the underlying material is silty clay loam or silty clay. In other areas the dark surface layer is thicker. In some places the surface layer and the underlying material are stratified silt loam or silty clay loam. In other places a seasonal high water table is within 3 feet of the surface.

Included with this soil in mapping are a few small areas where local flooding is more frequent. These areas are near drainageways. They make up 5 to 10 percent of the unit.

Water and air move through the upper part of the Sarpy Variant soil at a rapid rate and through the lower part at a moderate rate. Surface runoff is slow. A seasonal high water table is 3 to 5 feet below the surface from March through May in most years. Available water capacity is moderate. Organic matter content is low. Reaction in the surface layer is neutral. The underlying material is neutral or mildly alkaline. The potential for frost action is moderate.

Most areas are used for soybeans, wheat, or specialty crops, such as melons and pumpkins. Some areas are used as sites for dwellings. This soil is moderately suited to cultivated crops and specialty crops. It is poorly suited

to dwellings and septic tank absorption fields. It is moderately suited to evergreens.

Droughtiness, wind erosion, and low fertility are limitations in the areas used for cultivated crops or specialty crops. Returning crop residue to the soil and regularly adding other organic material improve fertility and conserve moisture. Irrigation helps to supply additional moisture. Leaving crop residue on the surface and maintaining properly spaced buffer areas of wheat or rye during the spring help to control wind erosion.

If this soil is used as woodland, protection from fire and grazing is essential. Chemicals and mechanical methods help to control competing vegetation when seedlings are becoming established.

The flooding is a hazard on sites for dwellings. Also, the seasonal wetness is a limitation on sites for dwellings with basements. An extensive system of levees reduces the hazard of flooding. Installing subsurface drains around the footings and foundations helps to lower the water table.

Because of the rapid permeability, ground water pollution is a hazard if standard septic tank absorption fields are installed. Also, the wetness is a severe limitation. A sealed sand filter and a disinfection tank help to prevent pollution of ground water. Diverting surface water away from the filter bed keeps the system functioning properly.

The land capability classification is IIIs.

6304A—Landes Variant very fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on ridges on bottom land. Levees generally provide protection against overflow from the Mississippi River, but the soil is subject to rare flooding. Individual areas are irregular in shape and are 10 to 40 acres in size.

Typically, the surface layer is very dark grayish brown, very friable very fine sandy loam about 17 inches thick. The subsoil extends to a depth of 60 inches. It is, in sequence downward, yellowish brown, very friable loam; dark brown, friable silty clay loam; brown, mottled, firm silty clay loam; yellowish brown, mottled, very firm silty clay; and dark grayish brown, mottled, firm silty clay loam. In some areas the layers of silty clay loam and silty clay in the subsoil are at a depth of more than 40 inches. In other areas the surface layer and the upper part of the subsoil are silt loam and silty clay loam. In some places the lower part of the subsoil and the underlying material are very fine sand or loamy fine sand. In other places the surface layer is thinner and lighter colored. In some areas a seasonal high water table is within 3 feet of the surface.

Included with this soil in mapping are small areas of the poorly drained Beaucoup soils in swales and depressions that are subject to ponding. Also included, near drainageways, are a few small areas where local flooding is more frequent. Included soils make up 10 to 15 percent of the unit.

Water and air move through the upper part of the Landes Variant at a moderately rapid rate and through the lower part at a slow rate. Surface runoff is slow. A seasonal high water table is 3 to 5 feet below the surface from March through May in most years. Available water capacity is high. Organic matter content is moderately low. Reaction in the surface layer varies because of local liming practices but commonly is strongly acid. The subsoil is slightly acid. It has a high shrink-swell potential. The potential for frost action is moderate.

Most areas are used for soybeans or wheat. Some are used for specialty crops, such as melons and pumpkins. Many are used as sites for dwellings and septic tank absorption fields. This soil is well suited to cultivated crops and specialty crops. It is poorly suited to dwellings and septic tank absorption fields.

Wind erosion is a hazard in the areas used for cultivated crops. Leaving crop residue on the surface and regularly adding other organic material help to control wind erosion, improve fertility, and maintain tilth.

The flooding and the shrink-swell potential are limitations on sites for dwellings. An extensive system of levees reduces the hazard of flooding. Reinforcing foundations and backfilling around the foundations with sand and gravel help to prevent the structural damage caused by shrinking and swelling.

The seasonal high water table and the slow permeability are severe limitations on sites for septic tank absorption fields. They can be overcome by installing a sealed sand filter and a disinfection tank.

The land capability classification is I.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal inputs

of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

About 217,240 acres in Madison County, or nearly 45 percent of the total acreage, meets the requirements for prime farmland. Associations 2, 3, 7, 8, and 9, which are described under the heading "General Soil Map Units," have the highest percentage of prime farmland, but this land is throughout the county.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Soils that have limitations, such as a seasonal high water table, frequent flooding during the growing season, or inadequate rainfall, qualify for prime farmland only in areas where these limitations have been overcome by such measures as drainage, flood control, or irrigation. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures. Most of the naturally wet soils listed in table 5 have been adequately drained.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1980, about 312,900 acres in Madison County was farmland. Of this acreage, about 126,200 acres was used for soybeans; 79,000 acres for corn; 62,500 acres for wheat; 27,000 acres for pasture; 15,800 acres for hay; 1,400 acres for sorghum; 500 acres for oats; 350 acres for rye; and 150 acres for barley (*6*).

The acreage used for soybeans, corn, and wheat fluctuates yearly in response to market conditions. During the last 10 years, the acreage used for soybeans and wheat has increased and the acreage used for corn has decreased. Wheat double cropped with soybeans is a popular crop rotation and is partly responsible for the increase in the acreage used for these crops. The two cash crops are harvested each year.

The acreage of farmland has decreased in recent years as more land is developed for urban uses. In 1976, about 70,300 acres was urban or built up land (*9*). The acreage of urban land has increased most dramatically since 1965. Urban development has occurred in small residential tracts and adjacent to existing towns throughout the county, commonly in areas of prime farmland. Because of the loss of prime farmland, some marginal land has been put into crop production. In many areas this land is not only less productive but also more erosive than the better farmland. Areas of wetland have also been drained and used for crop production, especially those on the bottom land along the Mississippi River.

Most of the soils in the county are well suited or moderately suited to cultivated crops. Soils that have slopes of more than 10 percent are poorly suited to cultivated crops because they are subject to excessive erosion. Soils that have slopes of more than 15 percent are generally unsuitable for cultivation. Other properties that affect suitability for crops and pasture are drainage, fertility, content of sodium, tilth, and moisture content.

Soils that have slopes of 2 percent or more are susceptible to erosion in excess of tolerable limits. Erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Valuable

nutrients are lost and tilth deteriorates as the more clayey subsoil is mixed with the plow layer. Erosion is especially damaging on soils that have a clayey or unfavorable subsoil or that have a root-restricting layer near the surface. Colp, Darwin, Marine, and Rushville soils are examples of soils that have a clayey subsoil. Darmstadt, Huey, Piasa, and Grantfork soils have an unfavorable subsoil that is high in content of exchangeable sodium. Gosport soils overlie root-restricting shale bedrock. Second, erosion is damaging when sediment and nutrients from eroding farmland enter ponds and streams (*7*). Erosion control helps to prevent the pollution of water by sediment and improves the quality of water for municipal use, recreation, and fish and wildlife.

Conservation practices provide a protective cover, control runoff, increase the infiltration rate, and reduce the susceptibility to erosion. The following paragraphs describe some of the conservation practices suitable for use in Madison County. A combination of these practices commonly is needed to control erosion.

A conservation cropping system that keeps a plant cover on the surface for extended periods can hold soil losses to an amount that does not destroy the productive capacity of the soil. Rotations in a conservation cropping system often include grasses and legumes. Including hay and pasture in the rotation provides the protective cover needed to control runoff and erosion, improve fertility, and improve tilth for the following crop.

Terraces are most effective in controlling erosion on the more sloping soils. They intercept surface runoff and conduct it to a stable outlet at a nonerosive velocity. They consist of a series of embankments or of ridges and channels that are properly spaced and graded. By varying the type and the design, a suitable terrace system can be developed for most of the more sloping soils in the county. Some of these soils, such as Darmstadt, Tamalco, and Grantfork soils, have a high content of sodium in the subsoil. The depth to a layer having a high content of sodium influences the suitability for terracing because this layer is more erosive and less productive than the overlying layer. Atlas, Hickory, Negley, Grantfork, and other soils that in many areas have short, steep slopes should be used for pasture, hay, or woodland.

Contour farming and conservation tillage also help to control erosion. Contour farming is planting and tilling on the contour of the land. It is most effective on slopes of 7 percent or less. It is often used in combination with terraces. Conservation tillage retains protective amounts of residue mulch on the surface throughout the year. It protects the soils from erosion, helps to maintain or promote good soil structure, helps to prevent compaction, and improves aeration, infiltration, and tilth.

The combination of conservation practices needed to control erosion on the soils in Madison County depends on the soil characteristics and the topography. Information about design of these practices is available at the office of the Madison County Soil and Water Conservation District.

The sandy soils in the county are susceptible to wind erosion. Maintaining a plant cover and surface mulch, keeping the surface rough through proper tillage, and establishing windbreaks and commercial evergreens are effective in controlling wind erosion.

Most of the poorly drained and somewhat poorly drained soils in the county are sufficiently drained for the production of row crops; however, additional drainage measures are needed on some soils. Unless these soils are drained, the wetness can damage crops or delay planting in some years.

The design of drainage systems varies with the kind of soil. Standard tile lines function well in the moderately permeable or moderately slowly permeable soils on bottom land if suitable outlets are available. Beaucoup, Birds, Lawson, and Wakeland soils are examples. Surface ditches are needed in some areas. Tiling is not effective in very slowly permeable soils on bottom land, such as Darwin, McFain, and Nameoki soils. Properly spaced surface ditches are needed to drain these soils. In areas that are subject to overflow during the growing season, protection from flooding may be needed. If the soils on the bottom land along the Mississippi River are sufficiently protected by levees, they can be used for crop production.

Standard tile lines function well in moderately permeable soils on uplands. A combination of random tile lines and surface inlets or surface ditches is needed. Land leveling, which smooths depressions, may also be needed. Standard tile lines do not function well in the slowly permeable or very slowly permeable upland soils.

Natural fertility is low in soils that have a high content of sodium in the subsoil. Darmstadt, Huey, Tamalco, and Grantfork soils are examples. Excessive amounts of sodium reduce the availability and uptake of some plant nutrients. Applications of gypsum help to neutralize the excess sodium and improve fertility. Returning crop residue to the soil and regularly adding manure and other organic material also improve fertility.

Soils that are naturally high in fertility have a thick, dark surface layer. Lawson, Tice, and Muscatine soils are examples. These soils formed under or were influenced by prairie grasses. They have a deep root zone and a high or very high available water capacity. Plants on these soils respond well to applications of fertilizer and lime.

Natural fertility is medium in Hurst, Rushville, Hosmer, and Weir soils. These soils formed under forest vegetation and have a light colored surface layer. Reaction ranges from extremely acid to slightly acid. Applications of limestone are needed to raise the pH level. The supply of available phosphorus and potash is low in some of these soils. Soil tests are needed to

determine the amounts of lime and fertilizer needed. Assistance in determining the proper kinds and amounts is available at the local office of the Cooperative Extension Service.

Tilth has important effects on seed germination and water infiltration. Soils with good tilth are granular and porous. The best tilth is in a silt loam surface layer that has a high content of organic matter and has granular structure. Tilth is good in many soils, including Lawson, Worthen, Herrick, Harrison, Cowden, Oconee, and Sable soils.

Soils that are low in organic matter content have weak structure in the surface layer. The severely eroded Rozetta, Elco, Colp, and Darmstadt soils are examples. A crust forms on the surface of these soils after hard rainfall. This crust is hard when dry. It reduces the rate of water infiltration and can result in excessive runoff and erosion. Crop residue management and additions of manure or other organic material improve the tilth of these soils.

Erosion can result in deterioration of tilth. As the subsoil is incorporated into a plow layer, in Atlas, Darmstadt, Grantfork, Elco, and other soils, the plow layer becomes more clayey. The rate of water infiltration is reduced and the runoff rate and the susceptibility to erosion are increased. The soils are sticky when wet and hard and cloddy when dry. Crop rotations that include several years of forage crops improve the tilth of these soils.

Providing adequate soil moisture in dry years is a concern in managing sandy soils and soils that have an unfavorable or root-restricting subsoil. These soils have a moderate or low available water capacity. Examples of soils that have an unfavorable or root-restricting subsoil are Atlas, Tamalco, Hosmer, and Gosport soils. Bloomfield, Oakville, and other sandy soils have a low available water capacity. Unless irrigated, they are too droughty in most years for the production of cultivated crops.

Assistance in managing specific tracts of land is available at the local office of the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered. A select committee evaluated yields data from local records for the period 1979 to 1981 against published data (*4*).

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management (*12*). The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

About 50 to 65 percent of Madison County was originally wooded. This woodland consisted mainly of oaks and hickories. Settlers cleared some of the forest for farmland and for wood to build homes and provide fuel. An increase in population and new farming technology during the latter part of the 19th century resulted in a large decrease in the wooded acreage. The demand for agricultural production during the 20th century and urban and suburban expansion have accelerated this decrease.

An estimated 54,200 acres was woodland in 1967 (*5*). Much of the woodland is not managed for commercial production. Only about 2,012 board feet is produced each year. This amount is well below the desirable production of 9,231 board feet per year.

Measures that exclude livestock, firebreaks, and proper logging procedures improve tree growth. Harvest cutting and intermediate cutting enhance regeneration and favor the desirable trees.

The most abundant trees on uplands are white oak, red oak, chinkapin oak, shingle oak, shagbark hickory, and pignut hickory. Silver maple, cottonwood, sycamore, box elder, and green ash are abundant on bottom land.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each suitable soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. It is based on the site index of the species listed first in the *common trees* column. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *r* indicates steep slopes; *x*, stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted rooting depth; *c*, clay in the upper part of the soil; *s*, sandy texture; and *f*, high content of coarse fragments in the soil profile. The letter *a* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: r, x, w, t, d, c, s, and f.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by

strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are timothy, bluegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are broom sedge, goldenrod, ragweed, foxtail, and smartweed.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, autumn-olive, and crabapple.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cattail, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include catbirds, warblers, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require

cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe (*14*). Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground

water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil

texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely

affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 17, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs, on the average, once or less in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the Illinois Department of Transportation.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); and Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*13*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the underlying material can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*11*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*13*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Ambraw Series

The Ambraw series consists of deep, poorly drained, moderately permeable or moderately slowly permeable soils on bottom land. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent.

Ambraw soils are similar to Beaucoup soils and are commonly adjacent to Beaucoup, La Hogue, and Onarga soils. Beaucoup soils are fine-silty and are on bottom land. The somewhat poorly drained La Hogue soils and the well drained Onarga soils are on terraces above the Ambraw soils. Onarga soils have less clay in the solum than the Ambraw soils.

Typical pedon of Ambraw loam, 990 feet west and 640 feet north of the southeast corner of sec. 36, T. 5 N., R. 9 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; few fine faint brown and dark brown (10YR 4/3) mottles; weak fine granular structure; friable; medium acid; abrupt smooth boundary.

A—9 to 16 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine subangular blocky structure; friable; medium acid; clear smooth boundary.

Bg1—16 to 28 inches; dark grayish brown (10YR 4/2) clay loam; few fine faint gray (10YR 5/1) and common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Bg2—28 to 34 inches; dark grayish brown (10YR 4/2) sandy clay loam; common medium faint gray (10YR 5/1) and prominent strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm; very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Bg3—34 to 57 inches; dark grayish brown (10YR 4/2) fine sandy loam; many medium faint gray (10YR 5/1) and prominent strong brown (7.5YR 4/6) mottles; weak coarse subangular blocky structure; friable; few very dark grayish brown (10YR 3/2) organic coatings lining pores on faces of peds; common medium irregular accumulations (iron and manganese oxides); medium acid; gradual smooth boundary.

BCg—57 to 60 inches; dark grayish brown (10YR 4/2) fine sandy loam; common coarse prominent strong brown (7.5YR 5/6) and faint grayish brown (2.5Y 5/2) mottles; weak coarse prismatic structure; friable; few very dark grayish brown (10YR 3/2) organic coatings lining pores on faces of peds; few fine irregular accumulations (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 40 to more than 60 inches. The mollic epipedon is 10 to 18 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is loam or clay loam. The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2 and has distinct mottles with higher chroma. It is clay loam, sandy clay loam, or fine sandy loam that has clay content of 24 to 35 percent. This horizon is medium acid or strongly acid.

Arenzville Series

The Arenzville series consists of deep, well drained, moderately permeable soils on flood plains. These soils formed in silty alluvium underlain by a dark buried soil. Slopes range from 0 to 2 percent.

Arenzville soils are similar to Haymond soils and are commonly adjacent to Birds, Haymond, Orion, and Worthen soils. Birds soils are poorly drained, contain more clay in the solum than the Arenzville soils, and are nearer the stream channel. Haymond soils do not have a dark buried soil within a depth of 40 inches. They are on bottom land. Orion soils are somewhat poorly drained and are on the slightly lower parts of the bottom land. Worthen soils have a mollic epipedon and are on foot slopes above the Arenzville soils.

Typical pedon of Arenzville silt loam, 264 feet east and 188 feet south of the center of sec. 32, T. 4 N., R. 8 W.

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable or very friable; common very fine roots; neutral; abrupt smooth boundary.

C1—9 to 19 inches; brown (10YR 5/3) silt loam; thin dark grayish brown (10YR 4/2) strata; few medium faint pale brown (10YR 6/3) mottles; weak medium platy structure; friable or very friable; common very fine roots; neutral; clear smooth boundary.

C2—19 to 26 inches; stratified dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; weak thick platy structure; very friable; few very fine roots; neutral; clear smooth boundary.

C3—26 to 34 inches; dark grayish brown (10YR 4/2) silt loam; thin very dark grayish brown (10YR 3/2) strata in the lower part; common medium faint brown (10YR 5/3) mottles; weak thick platy structure; very friable; few fine roots along the faces of peds; neutral; abrupt smooth boundary.

AB1—34 to 51 inches; very dark gray (10YR 3/1) silt loam; weak medium and coarse subangular blocky structure; friable; common brown (10YR 5/3) coatings along root channels; few fine roots along faces of peds; mildly alkaline; clear smooth boundary.

Ab2—51 to 60 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium and coarse subangular blocky structure; friable; few coarse rounded accumulations (iron and manganese oxides); few fine roots concentrated along vertical faces of peds; mildly alkaline.

The thickness of the A horizon is 6 to 15 inches. The depth to the Ab horizon is 20 to 40 inches. Reaction is medium acid to mildly alkaline throughout the profile.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The clay content in the control section is 12 to 18 percent. The C horizon has value of 4 or 5 and chroma

of 2 to 4. The Ab horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam.

Atlas Series

The Atlas series consists of deep, somewhat poorly drained, very slowly permeable soils on the side slopes along upland drainageways. These soils formed in a thin mantle of loess and in the underlying Sangamon paleosol. Slopes range from 5 to 15 percent.

Atlas soils are similar to Marine soils and are commonly adjacent to Grantfork, Hickory, Marine, and Rozetta soils. Marine soils formed in Peoria Loess, have less sand in the solum than the Atlas soils, and are on convex ridgetops. Grantfork soils have less clay in the solum than the Atlas soils and have a high content of sodium in the subsoil. They are on side slopes above the Atlas soils. Hickory soils have less clay in the subsoil than the Atlas soils, are well drained, and are below the Atlas soils on the side slopes. Rozetta soils formed in loess, are moderately well drained, and are on side slopes upstream from the Atlas soils.

Typical pedon of Atlas silty clay loam, 10 to 15 percent slopes, severely eroded, 720 feet south and 1,185 feet east of the northwest corner of sec. 8, T. 6 N., R. 7 W.

Ap—0 to 6 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; moderate fine subangular blocky structure; firm; medium acid; abrupt smooth boundary.

Bt—6 to 13 inches; pale brown (10YR 6/3) silty clay; common fine distinct yellowish brown (10YR 5/6) and common coarse faint light brownish gray (2.5Y 6/2) mottles; moderate fine and medium angular blocky structure; very firm; common distinct brown (10YR 4/3) and dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid; clear smooth boundary.

2Btg1—13 to 20 inches; light brownish gray (2.5Y 6/2) silty clay; common fine distinct yellowish brown (10YR 5/6) and common medium distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to strong fine and medium angular blocky; very firm; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few pebbles; medium acid; clear smooth boundary.

2Btg2—20 to 28 inches; light brownish gray (2.5Y 6/2) clay; few medium prominent strong brown (7.5YR 5/8) and common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few pebbles; medium acid; clear smooth boundary.

2Btg3—28 to 38 inches; light brownish gray (2.5Y 6/2) clay; common coarse prominent strong brown (7.5YR 5/8) and few fine distinct light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few pebbles; slightly acid; clear smooth boundary.

2Btg4—38 to 52 inches; light brownish gray (2.5Y 6/2) clay loam; common coarse prominent strong brown (7.5YR 5/8 and 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common pebbles; slightly acid; clear smooth boundary.

2Btg5—52 to 60 inches; light brownish gray (2.5Y 6/2) clay loam; many coarse prominent strong brown (7.5YR 5/8 and 5/6) mottles; weak coarse prismatic structure; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; common pebbles and fine chert fragments; neutral.

The thickness of the solum ranges from 50 to more than 60 inches. The depth to the strongly developed paleosol is less than 18 inches.

The Ap horizon has chroma of 2 or 3. It is commonly silty clay loam, but the range includes silt loam. The Bt and 2Bt horizons have hue of 10YR or 2.5Y and value of 4 to 6. They have chroma of dominantly 1 or 2, but the upper part may have chroma of 3. These horizons are silty clay, clay, or clay loam that has a clay content of 35 to 45 percent. They are strongly acid to neutral.

Atterberry Series

The Atterberry series consists of deep, somewhat poorly drained, moderately permeable soils on low upland ridges and knolls. These soils formed in loess. Slopes range from 1 to 4 percent.

Atterberry soils are similar to Muscatine and Stronghurst soils and are commonly adjacent to those soils and to Downs and Virden soils. Downs soils are moderately well drained and are on the higher ridges and knolls. Muscatine soils have a mollic epipedon. They are on broad ridges and knolls and are farther from drainageways than the Atterberry soil. Stronghurst soils do not have a dark surface layer. They are on ridges and are closer to drainageways than the Atterberry soils. Virden soils are poorly drained and are on upland flats and in depressions below the Atterberry soils.

Typical pedon of Atterberry silt loam, 1 to 4 percent slopes, 1,060 feet north and 500 feet west of the center of sec. 35, T. 4 N., R. 7 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

E1—8 to 11 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; few fine faint dark brown (10YR 4/3) mottles; weak fine granular structure; friable; common thin gray (10YR 6/1) silt coatings lining pores; few fine rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

E2—11 to 15 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; few fine faint dark yellowish brown (10YR 4/4) mottles; weak medium granular structure; friable; few fine rounded concretions (iron and manganese oxides); slightly acid; clear smooth boundary.

Bt—15 to 24 inches; dark brown (10YR 4/3) silty clay loam; common fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine or medium rounded concretions (iron and manganese oxides); medium acid; clear smooth boundary.

Btg—24 to 36 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); medium acid; gradual smooth boundary.

BCg—36 to 60 inches; grayish brown (10YR 5/2) silt loam; many coarse distinct yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure; friable; few faint dark grayish brown (10YR 4/2) clay films lining pores; few fine irregular accumulations (iron and manganese oxides); slightly acid.

The thickness of the solum ranges from 45 to more than 60 inches. The A horizon is 6 to 9 inches thick. It has value of 2 or 3 and chroma of 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is silty clay loam that has a clay content of 27 to 35 percent. This horizon is medium acid or strongly acid. The BCg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is slightly acid or neutral.

Beaucoup Series

The Beaucoup series consists of deep, poorly drained and very poorly drained, moderately slowly permeable soils on flood plains. These soils formed in stratified silty clay loam alluvium. Slopes range from 0 to 2 percent.

Beaucoup soils are similar to Darwin, Sable, and Tice soils and are commonly adjacent to Darwin, Riley, and Tice soils. Darwin soils are clayey. They are in landscape positions similar to those of the Beaucoup soils. Riley soils are somewhat poorly drained, contain more sand in the solum than the Beaucoup soils, and are on ridges above the Beaucoup soils. Sable soils formed in loess on upland flats. Tice soils are somewhat poorly drained, contain less clay in the solum than the Beaucoup soils, and are on the slightly higher bottom land above the Beaucoup soils.

Typical pedon of Beaucoup silty clay loam, 250 feet west and 172 feet south of the center of sec. 3,.T. 4 N., R. 9 W.

Ap—0 to 8 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium granular structure; firm; neutral; abrupt smooth boundary.

A—8 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine distinct light olive brown (2.5Y 5/4) mottles; moderate fine and medium subangular blocky structure; firm; neutral; clear smooth boundary.

Bg1—12 to 19 inches; dark gray (10YR 4/1) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; firm; common very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—19 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) and light gray (10YR 6/1) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common dark gray (10YR 4/1) organic coatings on faces of peds; few accumulations of secondary carbonates; slightly acid; clear smooth boundary.

Bg3—28 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) and few fine distinct gray (10YR 5/1) mottles; moderate medium prismatic structure; firm; few dark gray (5Y 4/1) organic coatings on faces of peds; few accumulations of secondary carbonates; neutral; clear smooth boundary.

BCg—36 to 45 inches; gray (5Y 5/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few dark gray (5Y 4/1) organic coatings on faces of peds; few accumulations of secondary carbonates; neutral; gradual smooth boundary.

Cg—45 to 60 inches; gray (5Y 5/1) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; few accumulations of secondary carbonates; mildly alkaline.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon is 10 to 18 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y or is neutral in hue. It has value of 4 to 6 and chroma of 0 to 2. It typically is silty clay loam that has a clay content of 27 to 35 percent. In some pedons this horizon has silt loam strata. It is medium acid to mildly alkaline. The Cg

horizon is silty clay loam or silt loam and in some pedons has strata of loam to very fine sandy loam.

Birds Series

The Birds series consist of deep, poorly drained, moderately slowly permeable soils on flood plains along the major streams. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Birds soils are similar to Orion and Wakeland soils and are commonly adjacent to those soils and to Fayette, Hickory, and Rozetta soils. Orion and Wakeland soils are somewhat poorly drained. Orion soils have a dark buried soil at a depth of 24 to 60 inches. They are on the narrower bottom land in upstream areas and along the tributaries of the major streams. Wakeland soils are in positions on bottom land similar to those of the Birds soils. Fayette and Hickory soils are well drained and are on side slopes above the Birds soils. Rozetta soils are moderately well drained and are on foot slopes.

Typical pedon of Birds silt loam, 80 feet north and 2,000 feet west of the center of sec. 24, T. 3 N., R. 7 W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, light brownish gray (10YR 6/2) dry; few fine distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; thin lenses of gray (10YR 6/1) silt grains along faces of peds; slightly acid; clear smooth boundary.

Cg1—8 to 13 inches; gray (5Y 5/1) silt loam; common medium prominent dark reddish brown (5YR 3/3) mottles; massive; firm; slightly acid; clear smooth boundary.

Cg2—13 to 19 inches; stratified very dark gray (5Y 3/1) and dark gray (5Y 4/1) silt loam and silty clay loam; common medium prominent dark reddish brown (5YR 3/4) mottles; massive; firm; few medium rounded accumulations (iron and manganese oxides); slightly acid; abrupt smooth boundary.

Cg3—19 to 39 inches; gray (5Y 6/1) silt loam; many medium prominent yellowish red (5YR 4/6) and yellowish brown (10YR 5/8) mottles; massive; friable; few fine rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Cg4—39 to 60 inches; mottled light brownish gray (2.5Y 6/2) and light gray (10YR 7/1) silt loam; many medium prominent yellowish brown (10YR 5/8) and few medium prominent yellowish red (5YR 4/6) mottles; massive; friable; few medium rounded accumulations (iron and manganese oxides); strongly acid.

The Ap horizon is 7 to 10 inches thick. It has a value of 4 or 5 and chroma of 1 or 2. The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. It has a clay content of 18 to 27 percent. Reaction ranges from strongly acid to neutral throughout the profile.

Bloomfield Series

The Bloomfield series consists of deep, well drained, rapidly permeable soils on terraces. These soils formed in sandy alluvial sediments that commonly have been reworked by the wind. Slopes range from 1 to 3 percent.

Bloomfield soils are similar to Oakville and Onarga soils and are commonly adjacent to those soils and to Ambraw and Ridgeville soils. Oakville and Onarga soils are in positions on terraces similar to those of the Bloomfield soils. Oakville soils are fine sand throughout. Onarga soils have a mollic epipedon. Ambraw soils are poorly drained, have a mollic epipedon, and formed in loamy alluvium on bottom land. Ridgeville soils are somewhat poorly drained, have a mollic epipedon, and are in the slightly lower landscape positions.

Typical pedon of Bloomfield loamy fine sand, 1 to 3 percent slopes, 1,580 feet east and 780 feet north of the center of sec. 19, T. 4 N., R. 8 W.

Ap—0 to 7 inches; brown (10YR 4/3) loamy fine sand, pale brown (10YR 6/3) dry; weak very fine granular structure; very friable; medium acid; clear smooth boundary.

E1—7 to 19 inches; brown (10YR 4/3) loamy fine sand; weak fine and very fine granular structure; very friable; slightly acid; gradual smooth boundary.

E2—19 to 35 inches; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) fine sand; single grain; loose; slightly acid; gradual wavy boundary.

E&Bt—35 to 50 inches; yellowish brown (10YR 5/4) fine sand (E); single grain; loose; wavy continuous bands of dark brown (7.5YR 4/4) loamy fine sand (Bt) 0.25 to 1.0 inch thick; weak fine subangular blocky structure; very friable; slightly acid; gradual wavy boundary.

Bt&E—50 to 60 inches; dark brown (7.5YR 4/4) fine sandy loam (Bt) interspersed with broken pockets of loamy fine sand; weak fine subangular blocky structure; very friable; wavy continuous bands of yellowish brown (10YR 5/4) fine sand (E) 0.5 to 1.0 inch thick; single grain; loose; slightly acid.

The thickness of the solum ranges from 55 to more than 70 inches. Reaction is strongly acid to slightly acid throughout the profile.

The Ap horizon has value of 4 and chroma of 2 or 3. It is fine sand or loamy fine sand. The E horizon has value of 4 or 5 and chroma of 3 or 4. The E part of the E&Bt and Bt&E horizons has value of 5 and chroma of 3 or 4. It is fine sand or loamy fine sand. The lamellae in these horizons have hue of 5YR or 7.5YR and value and chroma of 3 or 4. They are dominantly fine sandy loam, but some are loamy fine sand. Most are 0.25 to 1.0 inch thick, but some of those in the lower part of the pedon are as much as 8 inches thick.

Bold Series

The Bold series consists of well drained, moderately permeable soils on upland side slopes. These soils formed in calcareous loess. Slopes range from 15 to 30 percent.

Bold soils are commonly adjacent to Fayette, Raddle, Sylvan, and Wakeland soils. Fayette soils have an argillic horizon and are on ridgetops above the Bold soils. Raddle soils have a mollic epipedon, formed in silty alluvium, and are on foot slopes below the Bold soils. Sylvan soils have an argillic horizon and are deeper to calcareous loess than the Bold soils. Also, they are higher on the landscape. Wakeland soils are somewhat poorly drained and are on narrow bottom land.

Typical pedon of Bold silt loam, in an area of Sylvan-Bold silt loams, 20 to 30 percent slopes, 1,716 feet west and 1,270 feet south of the northeast corner of sec. 20, T. 4 N., R. 8 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slight effervescence; mildly alkaline; clear smooth boundary.

AC—5 to 12 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular and weak fine subangular blocky structure; common dark brown (10YR 3/3) fillings along root channels; friable; slight effervescence; mildly alkaline; clear smooth boundary.

C—12 to 60 inches; yellowish brown (10YR 5/4) silt loam; massive; very friable; strong effervescence; moderately alkaline.

The A horizon has value of 3 or 4 and chroma of 2 or 3. It is less than 6 inches thick. It is mildly alkaline or moderately alkaline. The Ap horizon has value of 4 to 6 and chroma of 3 to 5. The AC horizon, if it occurs, is 3 to 7 inches thick. It has value of 4 or 5 and chroma of 3 or 4. It is mildly alkaline or moderately alkaline. The C horizon has value of 5 or 6 and chroma of 2 to 5. The control section has a clay content of 12 to 18 percent.

Colp Series

The Colp series consists of deep, moderately well drained, slowly permeable soils on stream terraces. These soils formed in a thin mantle of loess and in the underlying lacustrine sediments. Slopes range from 1 to 10 percent.

Colp soils are similar to Hurst soils and are commonly adjacent to Hurst, Kendall, St. Charles, and Tice soils. Hurst and Tice soils are somewhat poorly drained. Hurst soils are on the lower parts of the terraces. Tice soils are on flood plains. Kendall soils are somewhat poorly drained, contain less clay in the subsoil than the Colp soils, and are on the slightly lower parts of the terraces. St. Charles soils are moderately well drained, have less clay in the subsoil than the Colp soils, and are on the slightly higher parts of the terraces.

Typical pedon of Colp silt loam, 1 to 4 percent slopes, 1,280 feet north and 100 feet east of the center of sec. 7, T. 4 N., R. 8 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; friable; many fine rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

E—8 to 12 inches; yellowish brown (10YR 5/4) silt loam; weak thin platy structure parting to weak very fine subangular blocky; friable; few thin light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

2Bt1—12 to 17 inches; brown (7.5YR 5/4) silty clay loam; strong fine and medium angular blocky structure; firm; few thin pale brown (10YR 6/3) silt coatings and common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; very strongly acid; abrupt smooth boundary.

2Bt2—17 to 29 inches; strong brown (7.5YR 4/6) silty clay; few fine prominent light brownish gray (10YR 6/2) mottles; moderate fine and medium prismatic structure; very firm; common distinct dark brown (7.5YR 4/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

2Bt3—29 to 39 inches; strong brown (7.5YR 5/6) silty clay loam; common medium prominent light brownish gray (10YR 6/2) and reddish brown (5YR 4/4) and common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure; very firm; common distinct brown (7.5YR 5/4) clay films on faces of peds; strongly acid; abrupt smooth boundary.

2C1—39 to 43 inches; reddish brown (2.5YR 4/4) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; strong medium angular blocky fragments; very firm; strongly acid; abrupt smooth boundary.

2C2—43 to 60 inches; brown (7.5YR 5/4) stratified silt loam and silty clay loam that has noticeable sand; common medium prominent reddish brown (2.5YR 4/4) and grayish brown (10YR 5/2) and common coarse distinct strong brown (7.5YR 4/6) mottles; weak coarse fragments; firm; strongly acid.

The thickness of the solum ranges from 35 to 50 inches. The A horizon has value of 4 or 5 and chroma of 2 to 4. It is commonly silt loam but in some eroded areas is silty clay loam or silty clay. The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is silty clay loam, silty clay, or clay that has a clay content of 35 to 48 percent. The subsoil ranges from medium acid to very strongly acid. The C horizon is

stratified silt loam, silty clay loam, or silty clay. It is strongly acid to neutral.

Cowden Series

The Cowden series consists of deep, slowly permeable, poorly drained soils on broad flats and in slight depressions on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

These soils have a higher pH in the upper part of the solum than is definitive for the Cowden series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Cowden soils are similar to Oconee, Rushville, and Virden soils and are commonly adjacent to Darmstadt, Oconee, Piasa, and Virden soils. Darmstadt and Oconee soils are somewhat poorly drained and are on ridges above the Cowden soils. Darmstadt soils have a natric horizon. Piasa soils also have a natric horizon. They occur as areas on broad flats intricately mixed with areas of the Cowden soils. Rushville soils have a surface layer that is lighter colored than that of the Cowden soils. Virden soils have a mollic epipedon and are in shallow upland drainageways and depressions slightly below the Cowden soils.

Typical pedon of Cowden silt loam, in an area of Cowden-Piasa silt loams, 1,150 feet north and 25 feet west of the southeast corner of sec. 30, T. 5 N., R. 5 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few fine rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

E1—8 to 12 inches; dark grayish brown (10YR 4/2) silt loam, gray (10YR 6/1) dry; weak thin platy and moderate fine subangular blocky structure; friable; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

E2—12 to 17 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/1) dry; common medium distinct light brownish gray (10YR 6/2) mottles; weak thin platy structure; friable; few medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—17 to 25 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine distinct light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/4) mottles; moderate medium angular blocky structure; very firm; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; many very dark gray (10YR 3/1) organic coatings on faces of peds; few medium accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg2—25 to 34 inches; dark grayish brown (10YR 4/2) silty clay; common fine distinct light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/6) mottles; moderate medium angular blocky structure; very firm; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common very dark gray (10YR 3/1) organic coatings on faces of peds; common medium irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg3—34 to 44 inches; dark grayish brown (2.5Y 4/2) silty clay; common fine distinct light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few very dark gray (10YR 3/1) organic coatings on faces of peds; common medium irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg4—44 to 52 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium faint gray (10YR 6/1) and common fine faint light olive brown (2.5Y 5/6) mottles; moderate medium subangular blocky structure; firm; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg5—52 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few faint gray (5Y 5/1) clay films on faces of peds; few medium irregular accumulations (iron and manganese oxides); neutral.

The thickness of the solum ranges from 50 to 60 inches. The A horizon is 7 to 9 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 to 6 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam or silty clay that has a clay content of 35 to 40 percent. This horizon is medium acid to neutral. The Cg horizon is slightly acid to mildly alkaline.

Darmstadt Series

The Darmstadt series consists of deep, somewhat poorly drained, very slowly permeable soils on upland ridges and side slopes. These soils formed in loess that has a high content of sodium. Slopes range from 1 to 8 percent.

Darmstadt soils are similar to Tamalco soils and are commonly adjacent to Cowden, Huey, Oconee, and Tamalco soils. Tamalco soils are moderately well drained, have a fine textured Bt horizon, and are on the higher ridges. Cowden soils are poorly drained, have a fine textured Bt horizon, and do not have a natric horizon. They are lower on the landscape than the

Darmstadt soils. Huey soils are subject to ponding and have a natric horizon that is closer to the surface than that of the Darmstadt soils. They are in the slightly lower landscape positions. Oconee soils do not have a natric horizon and have a fine textured Bt horizon. They occur as areas on ridges intricately mixed with areas of the Darmstadt soils.

Typical pedon of Darmstadt silt loam, 2 to 5 percent slopes, eroded, 990 feet west and 50 feet north of the southeast corner of sec. 29, T. 5 N., R. 5 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; neutral; abrupt smooth boundary.

Bt1—6 to 14 inches; brown (10YR 5/3) silty clay; common fine distinct strong brown (7.5YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few light brownish gray (10YR 6/2) silt coatings on faces of peds; mildly alkaline; clear smooth boundary.

Bt2—14 to 24 inches; pale brown (10YR 6/3) silty clay loam; common fine distinct yellowish brown (10YR 5/8) and few fine faint light brownish gray (10YR 6/2) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark yellowish brown (10YR 4/4) and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; moderately alkaline; clear smooth boundary.

Btg1—24 to 32 inches; light brownish gray (10YR 6/2) silty clay loam; common fine distinct strong brown (7.5YR 5/6) and few fine distinct brownish yellow (10YR 6/8) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; many distinct brown (10YR 5/3) clay films on faces of peds; moderately alkaline; clear smooth boundary.

Btg2—32 to 40 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate coarse subangular blocky structure; friable; common distinct grayish brown (10YR 5/2) clay films on faces of peds; moderately alkaline; clear smooth boundary.

Btg3—40 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; common faint grayish brown (10YR 5/2) clay films on faces of peds; strongly alkaline; clear smooth boundary.

Cg—49 to 60 inches; light gray (2.5Y 7/2) silt loam; many coarse prominent strong brown (7.5YR 5/6) mottles; massive; friable; strongly alkaline.

The thickness of the solum ranges from 49 to 60 inches. The depth to the natric horizon ranges from 10 to 25 inches.

The A horizon has value of 4 to 6 and chroma of 2 or 3. It is dominantly silt loam but is silty clay loam in severely eroded areas. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. It has a clay content of 27 to 35 percent. It ranges from strongly acid to moderately alkaline in the upper part and from mildly alkaline to strongly alkaline in the lower part.

Darwin Series

The Darwin series consists of deep, poorly drained and very poorly drained, very slowly permeable soils on flood plains. These soils formed in clayey alluvium. Slopes range from 0 to 2 percent.

Darwin soils are similar to Beaucoup, McFain, and Nameoki soils and are commonly adjacent to Ambraw, Beaucoup, Nameoki, and Tice soils. Beaucoup and Tice soils contain less clay in the solum than the Darwin soils and are on flood plains. Tice soils are somewhat poorly drained. McFain and Nameoki soils contain more sand and less clay in the lower part of the solum and in the underlying material than the Darwin soils. Nameoki soils are somewhat poorly drained and are on the low ridges above the Darwin soils. Ambraw soils contain less clay and more sand than the Darwin soils and are in the slightly higher positions on bottom land.

Typical pedon of Darwin silty clay, 1,445 feet west and 60 feet south of the northeast corner of sec. 36, T. 4 N., R. 9 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; few fine distinct brown (7.5YR 4/4) mottles; weak very fine subangular blocky structure; very firm; neutral; abrupt smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; common fine distinct brown (7.5YR 4/4) mottles; moderate medium angular blocky structure; very firm; neutral; clear smooth boundary.

Bg1—12 to 17 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; common fine distinct brown (7.5YR 4/4) mottles; moderate medium prismatic structure parting to moderate fine angular blocky; very firm; common very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg2—17 to 27 inches; dark gray (10YR 4/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong fine and medium angular blocky; very firm; many very dark gray (10YR 3/1) organic coatings on faces of peds; common dark gray

(10YR 4/1) slickensides visible on faces of peds; neutral; gradual smooth boundary.

Bg3—27 to 37 inches; dark gray (10YR 4/1) silty clay; common medium distinct yellowish brown (10YR 5/6) and brown (7.5YR 4/4) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very firm; many very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg4—37 to 45 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common dark gray (10YR 4/1) slickensides visible on faces of peds; many very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bg5—45 to 55 inches; gray (5Y 5/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common dark gray (10YR 4/1) slickensides visible on faces of peds; neutral; clear smooth boundary.

BCg—55 to 60 inches; gray (5Y 5/1) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; very firm; few dark gray (10YR 4/1) and gray (10YR 5/1) slickensides visible on faces of peds; mildly alkaline.

The thickness of the solum ranges from 50 to more than 60 inches. The thickness of the mollic epipedon ranges from 10 to 18 inches.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is commonly silty clay, but the range includes silty clay loam and clay. The Bg horizon has hue of 10YR, 2.5Y or 5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay or clay that has a clay content of 45 to 55 percent. This horizon is neutral or mildly alkaline.

Downs Series

The Downs series consists of deep, moderately well drained, moderately permeable soils on upland ridges, knolls, and side slopes. These soils formed in loess. Slopes range from 2 to 10 percent.

Downs soils are similar to Atterberry, Muscatine, and Rozetta soils and are commonly adjacent to those soils and to Fayette soils. Atterberry and Muscatine soils are somewhat poorly drained and surround areas of the Downs soils on the broad lower ridges. Muscatine soils have a mollic epipedon. Rozetta and Fayette soils have a surface layer that is lighter colored than that of the Down soils. Also, Rozetta soils are lower on the landscape. Fayette soils are well drained. They are on ridges upslope from the Downs soils or are on the steeper side slopes.

Typical pedon of Downs silt loam, 2 to 5 percent slopes, 1,300 feet south and 1,320 feet east of the northwest corner of sec. 23, T. 4 N., R. 8 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate thin platy structure parting to moderate fine granular; friable; slightly acid; abrupt smooth boundary.

E—7 to 11 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; few very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderate thin platy structure; friable; slightly acid; clear smooth boundary.

BE—11 to 17 inches; dark yellowish brown (10YR 4/4) silt loam; moderate coarse subangular blocky structure; firm; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—17 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong medium subangular blocky structure; firm; many prominent very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—25 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; strong coarse prismatic structure parting to strong coarse subangular blocky; firm; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

Btg—32 to 42 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint light yellowish brown (10YR 6/4) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; gradual smooth boundary.

BC—42 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint light yellowish brown (10YR 6/4) mottles; weak coarse prismatic structure; friable; few faint dark brown (10YR 3/3) clay films on faces of peds; neutral.

The thickness of the solum ranges from 50 to 65 inches. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It has a clay content of 27 to 35 percent. It is medium acid to neutral.

Dupo Series

The Dupo series consists of deep, somewhat poorly drained soils on flood plains. These soils formed in recent silty alluvium over a dark, clayey buried soil. They are moderately permeable in the upper part and slowly permeable in the lower part. Slopes range from 0 to 2 percent.

Dupo soils are similar to Orion soils and are commonly adjacent to Arenzville, Beaucoup, Darwin, and Worthen soils. Orion soils have a silt loam buried horizon and are on narrow bottom land. Arenzville soils are well drained, have a dark silt loam buried horizon, and are in the slightly higher positions on the flood plains. Beaucoup and Darwin soils are poorly drained, have a mollic epipedon, and are in the slightly lower positions on the flood plains. Also, Darwin soils formed in clayey slack-water sediments. Worthen soils have a mollic epipedon, are moderately well drained, and are on foot slopes above the Dupo soils.

Typical pedon of Dupo silt loam, 2,112 feet west and 140 feet north of the center of sec. 32, T. 4 N., R. 8 W.

Ap—0 to 8 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak medium granular structure; very friable; neutral; clear smooth boundary.

C1—8 to 16 inches; stratified brown (10YR 5/3) and grayish brown (10YR 5/2) silt loam; common medium faint light yellowish brown (10YR 6/4) and dark grayish brown (10YR 4/2) mottles; massive; very friable; neutral; gradual smooth boundary.

C2—16 to 22 inches; stratified yellowish brown (10YR 5/4) and grayish brown (10YR 5/2) silt loam; massive; very friable; common very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) organic coatings lining pores and on cleavage planes; mildly alkaline; abrupt smooth boundary.

C3—22 to 27 inches; dark gray (10YR 4/1) stratified silty clay loam and silt loam; few medium distinct light olive brown (2.5Y 5/4) and common medium faint dark grayish brown (2.5Y 4/2) mottles; massive; firm; common very dark grayish brown (10YR 3/2) organic coatings on cleavage planes; neutral; gradual smooth boundary.

2Ab—27 to 35 inches; mottled very dark gray (10YR 3/1) and dark gray (10YR 4/1) silty clay; common medium distinct light olive brown (2.5Y 5/6) and few fine distinct grayish brown (2.5Y 5/2) mottles; moderate fine and medium angular blocky structure; firm; neutral; clear smooth boundary.

2Bwb1—35 to 47 inches; very dark gray (10YR 3/1) silty clay; common medium distinct light olive brown (2.5Y 5/4) and dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very firm; strongly acid; clear smooth boundary.

2Bwb2—47 to 60 inches; very dark gray (10YR 3/1) silty clay; common fine distinct dark yellowish brown (10YR 4/6) and few fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; strongly acid.

The A horizon is 6 to 9 inches thick. The depth to the 2Ab horizon ranges from 20 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The content of clay is less than 18 percent in the upper part of the 10- to 40-inch control section and more than 45 percent in the lower part. The C horizon commonly has value of 3 to 6 and chroma of 2 to 4. It is slightly acid to mildly alkaline. The 2Ab and 2Bwb horizons have value of 2 or 3 and chroma of 1 or 2. They are silty clay loam, silty clay, or clay. They are strongly acid to neutral.

Elco Series

The Elco series consists of deep, moderately well drained soils on upland side slopes. These soils formed in loess and in the underlying Sangamon paleosol. They are moderately permeable in the upper part and moderately slowly permeable in the lower part. Slopes range from 5 to 15 percent.

Elco soils are similar to Fayette, Rozetta, and Stronghurst soils and are commonly adjacent to Hickory, Marine, Rozetta, and Stronghurst soils. Fayette, Rozetta, and Stronghurst soils formed in a mantle of loess that is thicker than that of the Elco soils. Fayette and Rozetta soils are on ridgetops above the Elco soils. Fayette soils are well drained. Stronghurst soils are somewhat poorly drained and are on the broader, less sloping ridgetops. Hickory soils are well drained and formed in Illinoian glacial till. They are on the more sloping side slopes in downstream areas. Marine soils are somewhat poorly drained and formed in a mantle of loess that is thicker than that of the Elco soils. Also, they have more clay in the subsoil and are on less sloping ridges.

Typical pedon of Elco silty clay loam, 5 to 10 percent slopes, severely eroded, 1,920 feet east and 405 feet south of the northwest corner of sec. 6, T. 4 N., R. 6 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) silty clay loam, light yellowish brown (10YR 6/4) dry; weak medium subangular blocky structure; firm; medium acid; clear smooth boundary.

Bt1—6 to 15 inches; dark brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common distinct brown (10YR 5/3) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—15 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct pale brown (10YR 6/3) and yellowish brown (10YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

2Bt3—24 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light

brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxides); visible sand grains; slightly acid; clear smooth boundary.

2Bt4—33 to 42 inches; pale brown (10YR 6/3) clay loam; common coarse distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure; firm; common distinct brown (10YR 5/3) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

2Btg1—42 to 54 inches; light brownish gray (10YR 6/2) clay loam; common fine distinct yellowish brown (10YR 5/8) and reddish brown (2.5YR 5/4) mottles; moderate medium prismatic structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

2Btg2—54 to 60 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; few faint grayish brown (10YR 5/2) clay films on faces of peds; few large irregular accumulations (iron and manganese oxides); neutral.

The thickness of the solum ranges from 50 to more than 80 inches. The thickness of the loess ranges from 20 to 40 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon is silt loam or silty clay loam. It has value of 4 or 5 and chroma of 3 or 4. The 2Bt horizon is silty clay loam or clay loam that has a clay content of 27 to 35 percent. This horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 4. The Bt and 2Bt horizons are strongly acid to neutral.

Fayette Series

The Fayette series consists of deep, well drained, moderately permeable soils on upland ridges and side slopes. These soils formed in loess. Slopes range from 2 to 30 percent.

Fayette soils are similar to Elco, Hickory, and Rozetta soils and are commonly adjacent to those soils and to Stronghurst and Wakeland soils. Elco and Hickory soils contain more sand and pebbles in the solum than the Fayette soils. Also, they are lower on the landscape. The moderately well drained Rozetta soils and the somewhat poorly drained Stronghurst soils are on the broader ridgetops. Wakeland soils are somewhat poorly drained and are on bottom land below the Fayette soils.

Typical pedon of Fayette silt loam, 2 to 5 percent slopes, 495 feet west and 260 feet north of the southeast corner of sec. 16, T. 4 N., R. 8 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; very friable; many fine roots inside peds; neutral; abrupt smooth boundary.

E1—5 to 9 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/4) dry; common fine faint dark yellowish brown (10YR 4/4) worm casts; moderate thin platy structure; very friable; many fine roots inside peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine rounded very dark gray (N 3/0) accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

E2—9 to 13 inches; yellowish brown (10YR 5/4) silt loam, light yellowish brown (10YR 6/4) dry; common fine distinct yellowish brown (10YR 5/6) worm casts; weak thick platy structure; very friable; many fine and medium roots inside peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine rounded very dark gray (N 3/0) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

BE—13 to 17 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct yellowish brown (10YR 5/6) worm casts; moderate medium subangular blocky structure; friable; common medium roots inside peds; common thin brown (7.5YR 4/4) clay films on faces of peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds, few fine rounded very dark gray (N 3/0) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Bt1—17 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to strong medium subangular blocky; firm; common fine roots between peds; many distinct brown (7.5YR 4/4) clay films on faces of peds; few fine rounded very dark gray (N 3/0) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—25 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; strong medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots between peds; many distinct brown (7.5YR 4/4) clay films on faces of peds; few dark brown (10YR 3/3) organic coatings on faces of peds; few fine irregular very dark gray (N 3/0) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt3—34 to 45 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots between peds; many distinct brown (7.5YR 4/4) clay films on faces of peds; few dark brown (7.5YR 3/2) organic coatings on faces of peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine irregular very dark gray (N 3/0) accumulations (iron and

manganese oxides); strongly acid; clear smooth boundary.

Bt4—45 to 54 inches; yellowish brown (10YR 5/4) silty clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; many distinct brown (7.5YR 4/4) clay films on faces of peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; few dark brown (7.5YR 3/2) organic coatings in root channels; common fine irregular very dark gray (N 3/0) accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

BC—54 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; moderate coarse prismatic structure; firm; few faint brown (7.5YR 4/4) clay films on faces of peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; many dark brown (7.5YR 3/2) organic coatings on faces of peds; common fine irregular very dark gray (N 3/0) accumulations (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 40 to 60 inches. The surface soil ranges from 8 to 16 inches in thickness.

The Ap horizon has chroma of 2 or 3. It is dominantly silt loam but is silty clay loam in severely eroded areas. The E horizon has value of 4 or 5 and chroma of 2 to 4. The Bt horizon has a clay content of 27 to 35 percent. It has value of 4 or 5 and chroma of 3 or 4. It is medium acid to very strongly acid.

Gosport Series

The Gosport series consists of moderately deep, moderately well drained, very slowly permeable soils on side slopes. These soils formed in shale residuum underlain by interbedded shale, siltstone, and sandstone. Slopes range from 15 to 30 percent.

These soils have more translocated clay, redder hue, and higher chroma in the subsoil than is definitive for the Gosport series. These differences, however, do not significantly affect the usefulness or behavior of the soils.

Gosport soils are commonly adjacent to Hickory, Rozetta, Stronghurst, and Wakeland soils. The adjacent soils are deeper to bedrock than the Gosport soils. Hickory soils are fine-loamy and are upslope from the Gosport soils. Rozetta and Stronghurst soils contain less clay in the solum than the Gosport soils. They are on ridgetops above the Gosport soils. Wakeland soils formed in silty alluvium on bottom land below the Gosport soils.

Typical pedon of Gosport silt loam, in an area of Hickory-Gosport silt loams, 15 to 30 percent slopes, 1,245 feet west and 1,370 feet south of the northeast corner of sec. 5, T. 4 N., R. 5 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; slightly acid; clear smooth boundary.

BE—5 to 9 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; medium acid; clear smooth boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 5/6) silty clay; few fine distinct yellowish red (5YR 5/8) and common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate fine and very fine angular and subangular blocky structure; firm; few faint yellowish brown (10YR 5/4) clay films on faces of peds; common fine and medium irregular accumulations (iron and manganese oxides); common granite and shale channers; very strongly acid; clear smooth boundary.

Bt2—17 to 24 inches; yellowish brown (10YR 5/4) silty clay; common medium distinct gray or light gray (5Y 6/1) and reddish yellow (5YR 6/8) mottles; moderate fine angular blocky structure; firm; few faint brown (10YR 5/3) clay films on faces of peds; many shale and ironstone channers; very strongly acid; clear smooth boundary.

BC—24 to 32 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/8) mottles; moderate fine and medium angular blocky structure; firm; many shale, siltstone, and ironstone channers; very strongly acid; abrupt wavy boundary.

Cr1—32 to 39 inches; light olive brown (2.5Y 5/4) silty clay shale; common medium distinct reddish yellow (5YR 6/8), light gray (N 6/0), and grayish brown (2.5Y 5/2) mottles; massive; weak medium rock structure of bedded shale; firm; very strongly acid; abrupt wavy boundary.

Cr2—39 to 60 inches; reddish brown (2.5YR 4/4) silty clay shale interbedded with siltstone and sandstone; few gray (N 5/0) coatings along shale cleavage planes; very strongly acid.

The thickness of the solum and the depth to shale range from 20 to 40 inches. The A horizon is 5 to 13 inches thick. The loess mantle is less than 15 inches thick.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has value of 5 or 6 and chroma of 3 to 6. It is silty clay, clay, or silty clay loam that has a clay content of 36 to 58 percent. This horizon is extremely acid to strongly acid.

Grantfork Series

The Grantfork series consists of deep, somewhat poorly drained, slowly permeable soils on upland side slopes. These soils formed in loamy erosional sediments

and in the underlying paleosol, which formed in Illinoian till. They have a high content of sodium in the subsoil. Slopes range from 5 to 15 percent.

Grantfork soils are similar to Atlas and Darmstadt soils and are commonly adjacent to those soils and to Elco and Lawson soils. Atlas soils have more clay and less sodium in the argillic horizon than the Grantfork soils. They occur as areas intricately mixed with areas of the Grantfork soils. Darmstadt soils have a natric horizon, formed in loess, and have less sand in the solum than the Grantfork soils. They are on ridges and side slopes upstream from the Grantfork soils. Elco soils have less sodium in the argillic horizon than the Grantfork soils, formed in loess and in the underlying paleosol, and are moderately well drained. They are in positions on side slopes similar to those of the Grantfork soils. Lawson soils formed in silty alluvium and are on bottom land below the Grantfork soils.

Typical pedon of Grantfork silty clay loam, in an area of Atlas-Grantfork silty clay loams, 5 to 10 percent slopes, severely eroded, 732 feet east and 560 feet north of the southwest corner of sec. 3, T. 6 N., R. 5 W.

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) silty clay loam, light yellowish brown (10YR 6/4) dry; weak fine and medium subangular blocky structure; firm; about 11 percent sand; few pebbles; neutral; abrupt smooth boundary.

Bt—5 to 12 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium angular blocky structure in 2-inch plowsole and weak medium subangular blocky structure below the plowsole; firm; many faint brown (10YR 4/3) clay films on faces of peds in the upper part and many faint dark grayish brown (10YR 4/2) clay films on faces of peds in the lower part; about 17 percent sand; few pebbles; neutral; clear smooth boundary.

Btg1—12 to 23 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; about 3 percent exchangeable sodium; about 24 percent sand; few pebbles; mildly alkaline; abrupt smooth boundary.

Btg2—23 to 29 inches; light brownish gray (2.5Y 6/2) loam; common medium prominent strong brown (7.5YR 5/8) and common fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium and coarse prismatic structure parting to weak medium angular blocky; firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded dark accumulations (iron and manganese oxides); about 6 percent exchangeable sodium; about 24 percent sand; few pebbles; moderately alkaline; clear smooth boundary.

Btg3—29 to 37 inches; grayish brown (10YR 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) and common fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded dark accumulations (iron and manganese oxides); about 8 percent exchangeable sodium; about 25 percent sand; few pebbles; moderately alkaline; clear smooth boundary.

2Btg4—37 to 49 inches; light brownish gray (10YR 6/2) clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds and dark brown (10YR 4/3) clay films lining pores; few fine irregular dark accumulations (iron and manganese oxides); about 10 percent exchangeable sodium; about 35 percent sand; few pebbles; moderately alkaline; clear smooth boundary.

2Btg5—49 to 57 inches; light brownish gray (10YR 6/2) loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) and dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine dark accumulations (iron and manganese oxides); about 11 percent exchangeable sodium; about 33 percent sand; few pebbles; moderately alkaline; clear smooth boundary.

2BCg—57 to 60 inches; light brownish gray (10YR 6/2) clay loam; many medium prominent yellowish red (5YR 5/8) and distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; common faint grayish brown (10YR 5/2) clay films on vertical faces of peds; common fine irregular dark accumulations (iron and manganese oxides); about 11 percent exchangeable sodium; about 41 percent sand; few pebbles; moderately alkaline.

The thickness of the solum ranges from 48 to more than 60 inches. The depth to Illinoian till ranges from 20 to 45 inches. The content of exchangeable sodium is 10 to 15 percent in one or more of the horizons between depths of 10 and 40 inches.

The Ap horizon is 5 to 9 inches thick. It has value of 4 or 5 and chroma of 3 or 4. It is silty clay loam or clay loam. The Bt horizon is silty clay loam, clay loam, loam, or silt loam that has a clay content of 27 to 35 percent. The upper part of this horizon has value of 4 to 6 and chroma of 3 or 4. It is slightly acid to moderately alkaline. The lower part has hue of 10YR or 2.5Y, value

of 4 to 6, and chroma of 1 to 3. It is moderately alkaline or strongly alkaline.

Harrison Series

The Harrison series consists of deep, moderately well drained, moderately permeable soils on prominent upland ridges. These soils formed in loess and in the underlying Illinoian drift. Slopes range from 2 to 10 percent.

Harrison soils are commonly adjacent to Darmstadt, Herrick, Piasa, Oconee, and Virden soils. Darmstadt soils are somewhat poorly drained, have high concentrations of sodium in the subsoil, and are on the slightly lower ridges and side slopes below Harrison soils. Herrick and Oconee soils are somewhat poorly drained, have a fine textured Bt horizon, and are lower on the landscape than the Harrison soils. Piasa and Virden soils are poorly drained and have a fine textured Bt horizon. Piasa soils have a natric horizon and are on broad flats below the Harrison soils. Virden soils are on broad flats and along upland drainageways.

Typical pedon of Harrison silt loam, 2 to 5 percent slopes, 620 feet west and 2,300 feet north of the southeast corner of sec. 15, T. 6 N., R. 5 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—7 to 10 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate medium granular structure; friable; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—10 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; common fine faint light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; many distinct dark brown (7.5YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—18 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; common fine faint brown (10YR 5/3) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct dark brown (7.5YR 3/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—29 to 41 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint strong brown (7.5YR 4/6) mottles; weak medium subangular blocky structure; friable; common distinct dark brown (7.5YR 4/4) clay films on faces of peds; few pebbles; slightly acid; gradual smooth boundary.

2Bt4—41 to 54 inches; strong brown (7.5YR 5/6) clay loam; weak coarse prismatic structure; friable; common dark brown (7.5YR 3/2) organic coatings lining pores; few distinct dark brown (7.5YR 4/4) clay films on faces of peds; common pebbles; medium acid; gradual smooth boundary.

2Bt5—54 to 60 inches; strong brown (7.5YR 5/6) clay loam; very weak coarse prismatic structure; friable; few faint dark brown (7.5YR 3/2 and 4/2) clay films lining pores; common pebbles; slightly acid.

The thickness of the solum ranges from 60 to 80 inches. The depth to the Illinoian drift ranges from 40 to 60 inches. The A horizon is 10 to 12 inches thick.

The A horizon has value of 3 and chroma of 2 or 3. The Bt horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 6. It is silty clay loam that has a clay content of 24 to 32 percent. This horizon is slightly acid to strongly acid. The 2Bt horizon has hue of 5YR or 7.5YR and value and chroma of 3 or 4. It is silt loam, loam, or clay loam. It is slightly acid or medium acid.

Harrison silt loam, 5 to 10 percent slopes, eroded, has a thinner dark A horizon than is definitive for the Harrison series. This difference, however, does not significantly affect the usefulness or behavior of the soil.

Haymond Series

The Haymond series consists of deep, well drained, moderately permeable soils on flood plains. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Haymond soils are similar to Arenzville soils and are commonly adjacent to Arenzville, Orion, Raddle, and Wakeland soils. Arenzville soils have a dark buried horizon within a depth of 40 inches. They are in landscape positions similar to those of the Haymond soils but are farther from the source of light colored sediments. Orion and Wakeland soils are somewhat poorly drained and are in the slightly lower landscape positions. Orion soils have a dark buried horizon within a depth of 40 inches. Raddle soils have a cambic horizon and are on foot slopes above the Haymond soils.

Typical pedon of Haymond silt loam, 42 feet west and 198 feet north of the center of sec. 24, T. 3 N., R. 9 W.

Ap—0 to 14 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; very weak fine subangular blocky structure; friable; medium acid; clear smooth boundary.

C1—14 to 33 inches; dark brown (10YR 4/3) silt loam; very weak fine subangular blocky structure; friable; medium acid; clear smooth boundary.

C2—33 to 44 inches; yellowish brown (10YR 5/4) silt loam; very weak fine subangular blocky structure; friable; neutral; clear smooth boundary.

C3—44 to 60 inches; pale brown (10YR 6/3) very fine sandy loam; massive; very friable; neutral.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The 10- to 40-inch control section has a clay content

of 12 to 18 percent. The C horizon has value of 4 to 6 and chroma of 3 or 4. It is silt loam or very fine sandy loam. Reaction ranges from medium acid to neutral throughout the profile.

Herrick Series

The Herrick series consists of deep, somewhat poorly drained, moderately slowly permeable soils on uplands. These soils formed in loess. Slope ranges from 0 to 3 percent.

Herrick soils are similar to Muscatine, Oconee, and Virden soils and are commonly adjacent to Harrison, Oconee, Piasa, and Virden soils. Muscatine soils have less clay in the subsoil than the Herrick soils. Oconee soils do not have a mollic epipedon. They are in landscape positions similar to those of the Herrick soils. Harrison soils are moderately well drained and are in the more sloping areas. Piasa and Virden soils are poorly drained and are in the lower positions on the landscape. Piasa soils have a natric horizon.

Typical pedon of Herrick silt loam, 0 to 3 percent slopes, 2,368 feet north and 350 feet west of the southeast corner of sec. 29, T. 3 N., R. 5 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

A—8 to 11 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine and very fine subangular blocky structure; friable; common fine roots; medium acid; clear smooth boundary.

E—11 to 18 inches; dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots along vertical faces of peds; common white (10YR 8/1 dry) silt coatings on faces of peds; common fine rounded black (10YR 2/1) concretions (iron and manganese oxides); strongly acid; abrupt smooth boundary.

Btg1—18 to 21 inches; dark grayish brown (10YR 4/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots along vertical faces of peds; common distinct black (10YR 2/1) clay films and organic coatings on faces of peds; common medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg2—21 to 30 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; moderate coarse prismatic structure parting to moderate coarse angular blocky; firm; few fine roots along vertical faces of peds; many distinct black (10YR 2/1) clay films on faces of peds; many medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg3—30 to 34 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate coarse angular blocky; firm; few fine roots along vertical faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg4—34 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct strong brown (7.5YR 5/8) and yellow (10YR 7/6) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few fine roots along vertical faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and few distinct very dark brown (10YR 2/2) clay films lining root channels; few medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Btg5—43 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse distinct strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure; firm; few fine roots along vertical faces of peds; few faint dark grayish brown (10YR 4/2) clay films on faces of peds and common distinct very dark brown (10YR 2/2) clay films lining root channels; few fine rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

BCg—50 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure; firm; few fine roots along vertical faces of peds; many distinct very dark brown (10YR 2/2) clay films lining root channels; few fine rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); slightly acid.

The thickness of the solum ranges from 40 to 65 inches. The thickness of the surface layer ranges from 10 to 14 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The E horizon has value of 3 or 4 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3 and has distinct mottles with higher chroma. It is silty clay loam or silty clay that has a clay content of 35 to 42 percent. This horizon is slightly acid to strongly acid. The BC horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6,

and chroma of 1 or 2. It is silty clay loam or silt loam. It is slightly acid or neutral.

Hickory Series

The Hickory series consists of deep, well drained, moderately permeable soils on upland side slopes. These soils formed either in a thin mantle of loess and the underlying glacial till or entirely in glacial till. Slopes range from 12 to 30 percent.

Hickory soils are similar to Elco, Fayette, and Rozetta soils and are commonly adjacent to those soils and to Gosport and Wakeland soils. Elco and Fayette soils are higher on the landscape than the Hickory soils. Elco soils formed in 20 to 40 inches of loess and in the underlying Sangamon paleosol. Fayette soils formed in loess. Rozetta soils are moderately well drained, formed in loess, and are on ridgetops above the Hickory soils. Gosport soils have a fine textured Bt horizon, are underlain by shale below a depth of 20 to 40 inches, and are downslope from the Hickory soils. Wakeland soils formed in silty alluvium and are on bottom land below the Hickory soils.

Typical pedon of Hickory silt loam, 15 to 30 percent slopes, 1,116 feet east and 264 feet south of the northwest corner of sec. 27, T. 6 N., R. 9 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine and fine granular structure; very friable; many fine and very fine roots between peds; medium acid; abrupt smooth boundary.

E—5 to 11 inches; yellowish brown (10YR 5/4) silt loam; very pale brown (10YR 7/4) relict mottles; moderate fine granular structure; friable; few very fine roots between peds; common brown (10YR 5/3) organic coatings on faces of peds; few pebbles; strongly acid; clear smooth boundary.

2BE—11 to 17 inches; dark yellowish brown (10YR 4/4) loam; common fine faint yellowish brown (10YR 5/8) relict mottles; weak fine subangular blocky structure; friable; common fine and very fine roots between peds; few fine irregular accumulations (iron and manganese oxides); common pebbles; very strongly acid; clear smooth boundary.

2Bt1—17 to 27 inches; yellowish brown (10YR 5/6) clay loam; common medium faint yellowish brown (10YR 5/8) and few fine distinct brownish yellow (10YR 6/8) relict mottles; weak fine prismatic structure parting to moderate fine subangular blocky; firm; few fine roots along vertical faces of peds; few distinct brown (7.5YR 4/4) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); common pebbles; very strongly acid; clear smooth boundary.

2Bt2—27 to 40 inches; yellowish brown (10YR 5/6) clay loam; many fine distinct yellowish brown (10YR 5/8) and common medium distinct light brownish gray (2.5Y 6/2) relict mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few fine roots along vertical faces of peds; few distinct brown (7.5YR 4/4) clay films on faces of peds; few fine irregular accumulations (iron and manganese oxides); common pebbles; very strongly acid; clear smooth boundary.

2Bt3—40 to 45 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct light brownish gray (2.5Y 6/2) and common medium prominent strong brown (7.5YR 5/8) relict mottles; weak fine prismatic structure; firm; many distinct brown (7.5YR 4/4) clay films on faces of peds; common pebbles; very strongly acid; gradual smooth boundary.

2Bt4—45 to 60 inches; yellowish brown (10YR 5/6) clay loam; many fine distinct light brownish gray (2.5Y 6/2) and few medium distinct strong brown (7.5YR 5/8) and yellowish brown (10YR 5/6) relict mottles; very weak medium prismatic structure; friable; common faint brown (7.5YR 4/4) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); common pebbles; strongly acid.

The thickness of the solum ranges from 45 to more than 60 inches. The thickness of the loess mantle ranges from 0 to 18 inches.

The Ap horizon, if it occurs, has value of 4 or 5 and chroma of 2 or 3. It is commonly silt loam, but the range includes loam and clay loam. The E horizon has value of 4 to 6 and chroma of 2 to 4. The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It has a clay content of 27 to 35 percent. It is very strongly acid to medium acid.

Hosmer Series

The Hosmer series consists of deep, moderately well drained soils on upland ridgetops. These soils formed in loess. They are moderately permeable in the upper part and very slowly permeable in the lower part. Slopes range from 2 to 5 percent.

Hosmer soils are similar to Fayette soils and are commonly adjacent to Fayette, Hickory, and Marine soils. The adjacent soils do not have fragipan characteristics. Fayette and Hickory soils are on side slopes below the Hosmer soils. Hickory soils formed in glacial till. Marine soils are somewhat poorly drained and are on the broader ridges.

Typical pedon of Hosmer silt loam, 2 to 5 percent slopes, 520 feet east and 400 feet south of the center of sec. 28, T. 3 N., R. 5 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—9 to 14 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; few fine faint brown (10YR 5/3) mottles; weak thin platy structure; friable; many light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; strongly acid; clear smooth boundary.

Bt1—14 to 19 inches; dark brown (10YR 4/3) silt loam; weak fine subangular blocky structure; friable; few distinct brown (10YR 5/3) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—19 to 25 inches; dark yellowish brown (10YR 4/4) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong fine subangular blocky; firm; common distinct brown (10YR 5/3) clay films on faces of peds; very strongly acid; abrupt smooth boundary.

B/E—25 to 30 inches; yellowish brown (10YR 5/4) silt loam (B); few fine faint yellowish brown (10YR 5/6) mottles; strong fine subangular blocky structure; firm; many prominent pale brown (10YR 6/3) silt coatings on faces of peds (E); few fine rounded accumulations (iron and manganese oxides); strongly acid; abrupt smooth boundary.

Btx1—30 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; brittle; common distinct brown (10YR 5/3) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

Btx2—39 to 53 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; moderate very coarse prismatic structure parting to weak coarse subangular blocky; firm; brittle; common distinct brown (10YR 5/3) clay films on faces of peds; many prominent pale brown (10YR 6/3) silt coatings on faces of peds; common fine rounded accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

C—53 to 60 inches; brown (10YR 5/3) and dark yellowish brown (10YR 4/4) silt loam; common fine distinct yellowish brown (10YR 5/8) mottles; massive; friable; few pale brown (10YR 6/3) silt coatings in cracks; common fine rounded concretions (iron and manganese oxides); neutral.

The thickness of the solum ranges from 50 to 80 inches. The depth to a horizon having fragipan characteristics ranges from 25 to 36 inches. The surface soil is 8 to 14 inches thick.

The A horizon has value of 4 or 5 and chroma of 2 or 3. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is strongly acid or very strongly acid. The Btx horizon has value of 4 to 6 and chroma of 3 or 4. It is silt loam or silty clay loam. In some pedons it does not have clay films in one or more subhorizons. It is very strongly acid to medium acid.

Huey Series

The Huey series consists of deep, poorly drained, very slowly permeable soils on broad upland flats. These soils formed in Peorian Loess. Slopes range from 0 to 2 percent.

These soils do not have the 15 percent exchangeable sodium within 16 inches of the surface that is definitive for the Huey series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Huey soils are similar to Darmstadt soils and are commonly adjacent to Darmstadt, Oconee, Rushville, and Tamalco soils. Darmstadt and Oconee soils are somewhat poorly drained, are gently sloping, and are on ridgetops. Oconee soils do not have a natric horizon. Rushville soils have a fine textured Btg horizon and do not have a natric horizon. They occur as areas intricately mixed with areas of the Huey soils. Tamalco soils are moderately well drained, have a fine textured Bt horizon, and are on convex ridgetops.

Typical pedon of Huey silt loam, in an area of Rushville-Huey silt loams, 1,780 feet south and 280 feet east of the northwest corner of sec. 30, T. 5 N., R. 5 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine and fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—9 to 14 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; very weak fine subangular blocky and very weak thin platy structure; friable; common fine round accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

Btg1—14 to 19 inches; grayish brown (10YR 5/2) silty clay loam; common fine faint light brownish gray (2.5Y 6/2) and distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); few white (10YR 8/1 dry) silt coatings on faces of peds; neutral; clear smooth boundary.

Btg2—19 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent strong brown (7.5YR 5/6) and faint grayish brown (10YR 5/2) mottles; weak medium prismatic structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many very dark grayish brown (10YR 3/2) organic coatings lining root channels; common fine rounded concretions (iron and manganese oxides); few coarse rounded calcium carbonate concretions; few white (10YR 8/1 dry) silt coatings on faces of peds; moderately alkaline; clear smooth boundary.

Btg3—32 to 44 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong

brown (7.5YR 5/6) and common medium faint light brownish gray (10YR 6/2) mottles; weak medium prismatic structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded concretions (iron and manganese oxides); few coarse rounded calcium carbonate concretions; few white (10YR 8/1 dry) silt coatings on faces of peds; moderately alkaline; clear smooth boundary.

2Btg4—44 to 52 inches; grayish brown (2.5Y 5/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure; firm; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded accumulations (iron and manganese oxides); few medium rounded calcium carbonate concretions; moderately alkaline; gradual smooth boundary.

2BCg—52 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6 and 5/8) mottles; weak coarse subangular blocky structure; friable; moderately alkaline.

The thickness of the solum ranges from 35 to 65 inches. The depth to the natric horizon is less than 20 inches.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The E horizon has value of 5 to 7 and chroma of 2. The B horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It has a clay content of 27 to 35 percent. It is medium acid to neutral in the upper part and moderately alkaline or strongly alkaline in the lower part.

Hurst Series

The Hurst series consists of deep, somewhat poorly drained, very slowly permeable soils on terraces. These soils formed in clayey lacustrine sediments. Slopes range from 0 to 2 percent.

Hurst soils are similar to Colp soils and commonly are adjacent to Colp, St. Charles, and Tice soils. Colp soils are moderately well drained and are on the slightly higher, more sloping terraces and terrace escarpments. St. Charles soils are moderately well drained, are fine-silty, and are on the slightly higher parts of the terraces. Tice soils have a mollic epipedon, have less clay in the subsoil than the Hurst soils, and are lower on the landscape.

Typical pedon of Hurst silty clay loam, 1,110 feet south and 2,260 feet west of the northeast corner of sec. 7, T. 4 N., R. 8 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam, grayish brown (10YR 5/2) dry; common fine distinct reddish brown (5YR 4/3) mottles; moderate fine subangular blocky structure parting to weak fine granular; firm; few very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine irregular accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

Bt1—6 to 14 inches; dark grayish brown (10YR 4/2) silty clay; few fine distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint light brownish gray (2.5Y 6/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

Bt2—14 to 31 inches; olive brown (2.5Y 4/4) silty clay; common fine faint light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; firm; few distinct light brownish gray (2.5Y 6/2) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); slightly acid; gradual smooth boundary.

Bt3—31 to 39 inches; olive brown (2.5Y 4/4) silty clay; common fine distinct olive (5Y 5/4), dark yellowish brown (10YR 4/6), and red (10R 4/6) mottles; moderate medium subangular blocky structure; firm; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine irregular accumulations (iron and manganese oxides); neutral; gradual smooth boundary.

C—39 to 60 inches; stratified dark brown (7.5YR 4/4) and dark yellowish brown (10YR 4/6) silty clay loam and silty clay; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; firm; common fine irregular accumulations (iron and manganese oxides); moderately alkaline.

The Ap horizon ranges from 6 to 10 inches in thickness. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The Bt horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 to 4. It is very strongly acid to neutral. It is silty clay or clay. The argillic horizon has a clay content of 35 to 48 percent. The C horizon is stratified silt loam, silty clay loam, and silty clay. It is strongly acid to moderately alkaline.

Kendall Series

The Kendall series consists of deep, somewhat poorly drained, moderately permeable soils on stream terraces. These soils formed in silty sediments. Slopes range from 0 to 3 percent.

These soils do not have the lithologic discontinuity within the solum that is definitive for the Kendall series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Kendall soils are similar to Stronghurst soils and are commonly adjacent to Colp and St. Charles soils. Stronghurst soils formed in loess on uplands. Colp soils are moderately well drained, formed in clayey lacustrine

sediments, and are on the more sloping terrace ridges. St. Charles soils are moderately well drained and are on the more sloping terrace ridges and side slopes.

Typical pedon of Kendall silt loam, 0 to 3 percent slopes, 1,270 feet north and 780 feet east of the southwest corner of sec. 1, T. 4 N., R. 9 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; slightly acid; abrupt smooth boundary.

E—9 to 17 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; common fine distinct dark yellowish brown (10YR 4/6) and common medium faint grayish brown (10YR 5/2) mottles; weak medium platy structure parting to weak very fine subangular blocky in the lower part; friable; medium acid; clear smooth boundary.

Bt1—17 to 26 inches; dark brown (10YR 4/3) silty clay loam; many medium faint dark grayish brown (10YR 4/2) and common medium distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; many prominent grayish brown (10YR 5/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—26 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) and few medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure parting to moderate fine subangular blocky; firm; many prominent grayish brown (10YR 5/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt3—33 to 42 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/6) mottles; moderate coarse subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few very dark gray (10YR 3/1) organic coatings lining root channels; strongly acid; clear smooth boundary.

Bt4—42 to 47 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct light brownish gray (2.5Y 6/2) and common medium faint yellowish brown (10YR 5/6) mottles; very weak coarse subangular blocky structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few very dark gray (10YR 3/1) organic coatings lining root channels; strongly acid; clear smooth boundary.

C—47 to 60 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; massive; friable; medium acid.

The thickness of the solum ranges from 45 to more than 60 inches. The surface soil ranges from 10 to 18 inches in thickness.

The Ap horizon has value of 4 or 5 and chroma of 2. The Bt horizon has value of 4 or 5 and chroma of 2 to 4 and has distinct mottles. It is strongly acid to slightly acid. The upper part of this horizon is silty clay loam that has a clay content of 27 to 35 percent. The lower part is silt loam or silty clay loam.

La Hogue Series

The La Hogue series consists of deep, somewhat poorly drained soils on broad terrace ridges. These soils formed in loamy and sandy alluvial deposits. They are moderately permeable in the upper part and moderately rapidly permeable in the lower part. Slopes range from 0 to 3 percent.

La Hogue soils are commonly adjacent to Ambraw, Onarga, Raddle, and Tice soils. Ambraw soils are poorly drained and are on bottom land. Onarga soils are well drained and are on the higher parts of terraces. They contain less clay and more sand than the La Hogue soils. Raddle and Tice soils do not have an argillic horizon and contain less sand than the La Hogue soils. Raddle soils are on terraces and foot slopes, and Tice soils are on bottom land.

Typical pedon of La Hogue loam, 0 to 3 percent slopes, 396 feet east and 2,448 feet south of northwest corner of sec. 7, T. 4 N., R. 8 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; mildly alkaline; clear smooth boundary.

A—9 to 12 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few fine and medium irregular brown and dark brown (7.5YR 4/4) accumulations (iron and manganese oxides); mildly alkaline; clear smooth boundary.

BA—12 to 18 inches; very dark grayish brown (10YR 3/2) clay loam; weak very fine subangular blocky structure; firm; common very dark gray (10YR 3/1) and black (10YR 2/1) organic coatings on faces of peds; common fine and medium strong brown (7.5YR 5/8) irregular accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Btg1—18 to 26 inches; dark grayish brown (10YR 4/2) clay loam; common medium prominent strong brown (7.5YR 5/8) and few medium faint dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common distinct very dark gray (10YR 3/1) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Btg2—26 to 32 inches; dark grayish brown (10YR 4/2) sandy clay loam; common medium distinct strong

brown (7.5YR 4/6) and dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure; firm; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; common medium irregular accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

BC—32 to 40 inches; brown (7.5YR 4/2) fine sandy loam; common medium and coarse distinct strong brown (7.5YR 4/6) and dark brown (10YR 4/3) mottles; weak medium prismatic structure; friable; common medium irregular accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

C—40 to 60 inches; strong brown (7.5YR 4/6) loamy fine sand; common medium distinct brown (7.5YR 5/4) mottles; single grain; loose; some sand grains bridged with iron and manganese oxides; slightly acid.

The thickness of the solum ranges from 40 to 60 inches. The mollic epipedon ranges from 10 to 24 inches in thickness and includes the BA horizon or the upper part of the Bt horizon in some pedons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The BA horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is loam or clay loam. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. It is clay loam or sandy clay loam. It is medium acid to neutral. The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 1 to 8. It is fine sand or loamy fine sand. It is slightly acid or neutral.

Landes Series

The Landes series consists of deep, well drained soils on natural levees on bottom land. These soils formed in loamy and sandy, stratified alluvium. They are moderately rapidly permeable in the upper part and rapidly permeable in the lower part. Slopes range from 0 to 5 percent.

These soils have less fine, medium, and coarse sand in the control section than is definitive for the Landes series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Landes soils are similar to Sarpy Variant soils and are commonly adjacent to Darwin, McFain, Nameoki, and Riley soils. Sarpy Variant soils are moderately well drained and formed in stratified, sandy alluvium over silty alluvium. They are on natural levees. Darwin and McFain soils are poorly drained, have a fine textured solum, and are in swales and depressions. Nameoki soils are somewhat poorly drained, have a fine textured solum, and are in the slightly lower landscape positions. Riley soils are somewhat poorly drained and are on low ridges.

Typical pedon of Landes very fine sandy loam, 1 to 5 percent slopes, 1,645 feet south and 858 feet west of the northeast corner of sec. 4, T. 3 N., R. 9 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; very friable; slightly acid; abrupt smooth boundary.

A—7 to 16 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, grayish brown (10YR 5/2) dry; weak medium granular structure; very friable; neutral; clear smooth boundary.

Bw1—16 to 24 inches; brown (10YR 4/3) very fine sandy loam; weak medium subangular blocky structure; very friable; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw2—24 to 33 inches; brown (10YR 4/3) very fine sandy loam; weak medium and coarse subangular blocky structure; very friable; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; gradual smooth boundary.

C1—33 to 43 inches; brown (10YR 4/3) loamy very fine sand; few fine faint dark yellowish brown (10YR 4/4) mottles; massive; very friable; neutral; clear smooth boundary.

C2—43 to 54 inches; brown (10YR 4/3) very fine sandy loam; common fine faint yellowish brown (10YR 5/4) mottles; massive; very friable; neutral; clear smooth boundary.

C3—54 to 60 inches; brown (10YR 5/3) stratified silt loam and very fine sandy loam; massive; very friable; mildly alkaline.

The thickness of the solum ranges from 25 to 40 inches. The A horizon has value of 2 or 3 and chroma of 1 to 3. It is very fine sandy loam or fine sandy loam. The Bw horizon has value of 3 to 6 and chroma of 3 or 4. It is very fine sandy loam or loamy very fine sand that has a clay content of 12 to 18 percent. This horizon is slightly acid to mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4.

Landes Variant

The Landes Variant consists of deep, moderately well drained soils on low ridges. These soils formed in loamy and clayey alluvium. They are moderately rapidly permeable in the upper part and slowly permeable in the lower part. Slopes range from 0 to 3 percent.

Landes Variant soils are similar to Dupo soils and are commonly adjacent to Beaucoup, Landes, and Tice soils. Dupo soils are somewhat poorly drained and do not have a mollic epipedon. Beaucoup soils are poorly drained and formed in silty clay loam alluvium in swales on bottom land. Landes soils are well drained and formed in loamy alluvium over sandy alluvium. They are

on ridges on bottom land. Tice soils are somewhat poorly drained and formed in silty alluvium on the slightly lower parts of bottom land.

Typical pedon of Landes Variant very fine sandy loam, 0 to 3 percent slopes, in a cultivated field; 100 feet west and 1,600 feet north of the center of sec. 6, T. 3 N., R. 9 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, grayish brown (10YR 5/2) dry; weak medium granular structure; very friable; strongly acid; clear smooth boundary.

A—10 to 17 inches; very dark grayish brown (10YR 3/2) very fine sandy loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; very friable; medium acid; clear smooth boundary.

Bw1—17 to 27 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; very friable; neutral; abrupt smooth boundary.

Bw2—27 to 31 inches; dark brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; about 10 percent sand by volume; neutral; abrupt smooth boundary.

2Bw3—31 to 48 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium and coarse subangular blocky structure; firm; neutral; clear smooth boundary.

2Bw4—48 to 56 inches; yellowish brown (10YR 5/4) silty clay; common fine faint yellowish brown (10YR 5/6) and common medium distinct strong brown (7.5YR 4/6) mottles; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; very firm; neutral; clear smooth boundary.

2Bw5—56 to 60 inches; dark grayish brown (10YR 4/2) silty clay loam; common medium distinct strong brown (7.5YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium prismatic structure; firm; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to the 2B horizon ranges from 24 to 40 inches. The mollic epipedon is 10 to 19 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. It is commonly loam or very fine sandy loam, but the range includes silt loam and loamy very fine sand. This horizon is strongly acid to neutral. The Bw horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is silty clay loam to very fine sandy loam. The clay content in this horizon is 12 to 18 percent. The 2Bw horizon is silty clay loam or silty clay that has a clay content of 35 to 45 percent. The B horizon is slightly acid to mildly alkaline.

Lawson Series

The Lawson series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Lawson soils are similar to Tice soils and are commonly adjacent to Birds, Hickory, Orion, and Tice soils. Tice soils have a mollic epipedon that is thinner than that of the Lawson soils. Also, they are closer to stream channels. Birds soils are poorly drained, do not have a mollic epipedon, and are on the lower parts of bottom land. Hickory soils formed in glacial till, are well drained, and are on side slopes in the uplands. Orion soils have light colored, silty sediments over a buried soil. They are closer to stream channels than the Lawson soils.

Typical pedon of Lawson silt loam, 165 feet west and 1,485 feet north of the southeast corner of sec. 8, T. 6 N., R. 7 W.

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; neutral; abrupt smooth boundary.

A1—9 to 21 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium subangular blocky structure; friable; few very dark grayish brown (10YR 3/2) organic fillings along root channels; neutral; clear smooth boundary.

A2—21 to 30 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium subangular blocky structure; friable; common dark brown (10YR 3/3) organic fillings along root channels; few fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); neutral; gradual smooth boundary.

C—30 to 37 inches; stratified very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) silt loam; common medium distinct brown (10YR 4/3) mottles; moderate medium and coarse subangular blocky structure; friable; many black (10YR 2/1) organic coatings on faces of peds; few medium rounded dark reddish brown (5YR 3/4) accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Cg1—37 to 52 inches; grayish brown (10YR 5/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium rounded dark brown (10YR 3/3) accumulations (iron and manganese oxides); neutral; gradual smooth boundary.

Cg2—52 to 60 inches; grayish brown (10YR 5/2) silt loam; few medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; common very dark gray (10YR 3/1) organic coatings lining root

channels; common medium rounded dark brown (10YR 3/3) accumulations (iron and manganese oxides); common pebbles; neutral.

The thickness of the solum and of the mollic epipedon ranges from 24 to 36 inches. The A horizon has value of 2 or 3 and chroma of 1 or 2. The control section is silt loam or silty clay loam and has a clay content of 18 to 30 percent. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3.

Marine Series

The Marine series consists of deep, somewhat poorly drained, slowly permeable soils on upland ridges and flats. These soils formed in loess. Slopes range from 0 to 5 percent.

Marine soils are similar to Oconee and Rushville soils and are commonly adjacent to Hosmer, Rozetta, and Rushville soils. Oconee soils have a surface layer that is darker than that of the Marine soils and are not characterized by an abrupt textural change. They are gently sloping and are on ridges. Rushville soils are poorly drained and are on broad flats and in depressions below the Marine soils. Hosmer and Rozetta soils are on narrow ridges and are moderately well drained. They are fine-silty and are not characterized by an abrupt textural change.

Typical pedon of Marine silt loam, 0 to 2 percent slopes, 2,030 feet east and 650 feet south of the northwest corner of sec. 21, T. 3 N., R. 5 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.

E—9 to 17 inches; light brownish gray (10YR 6/2) silt loam, white (10YR 8/1) dry; few fine distinct yellowish brown (10YR 5/8) mottles; weak thin platy structure; friable; very strongly acid; abrupt smooth boundary.

Bt1—17 to 25 inches; brown (10YR 4/3) silty clay; few fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to strong fine angular blocky; very firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—25 to 34 inches; brown (10YR 5/3) silty clay loam; common fine distinct grayish brown (2.5Y 5/2) and brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); very strongly acid; clear smooth boundary.

Btg1—34 to 43 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) and common coarse distinct brownish yellow (10YR 6/8) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few rounded black (N 2/0) accumulations (iron and manganese oxides); very strongly acid; clear smooth boundary.

Btg2—43 to 52 inches; light brownish gray (2.5Y 6/2) silty clay loam; common coarse distinct brownish yellow (10YR 6/8) and common medium prominent strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure; firm; many faint grayish brown (2.5Y 5/2) clay films on faces of peds; few rounded black (10YR 2/1) accumulations (iron and manganese oxides); slightly acid; gradual smooth boundary.

BCg—52 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common coarse prominent strong brown (7.5YR 5/8) mottles; very weak coarse subangular blocky structure; friable; few faint grayish brown (2.5Y 5/2) clay films on faces of peds; slightly acid.

The thickness of the solum ranges from 50 to 70 inches. The loess mantle is more than 60 inches thick. The surface soil is 12 to 18 inches thick.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4 and has distinct mottles. It is silty clay loam or silty clay that has a clay content of 35 to 45 percent. This horizon is very strongly acid to slightly acid. The BCg horizon has value of 5 or 6 and chroma of 1 or 2 and has distinct mottles with higher chroma. It is medium acid or slightly acid.

McFain Series

The McFain series consists of deep, poorly drained, slowly permeable soils on bottom land. These soils formed in clayey alluvium and in the underlying stratified, loamy alluvium. Slopes are 0 to 1 percent.

These soils are taxadjuncts to the McFain series because they do not have the free carbonates in the solum and because the clayey alluvium is slightly thicker than is definitive for the series. These differences, however, do not significantly affect the usefulness or behavior of the soils.

McFain soils are similar to Darwin soils and are commonly adjacent to Landes, Nameoki, and Riley soils. Darwin soils are clayey throughout and do not have contrasting textures. They are in positions on bottom land similar to those of the McFain soils. Landes soils are well drained and formed in loamy alluvium over sandy alluvium. They are on ridges above the McFain

soils. Nameoki soils are somewhat poorly drained and are on low ridges on the slightly higher parts of the landscape. Riley soils are somewhat poorly drained and formed in loamy alluvium over sandy alluvium. They are on ridges above the McFain soils.

Typical pedon of McFain silty clay, 800 feet west and 1,450 feet south of the northeast corner of sec. 27, T. 3 N., R. 9 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate medium angular blocky structure; very firm; slightly acid; clear smooth boundary.

A—8 to 14 inches; very dark gray (10YR 3/1) silty clay; common fine prominent strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) mottles; moderate fine and medium angular blocky structure; very firm; slightly acid; clear smooth boundary.

Bg1—14 to 27 inches; dark gray (5Y 4/1) silty clay; common fine and medium prominent strong brown (7.5YR 5/6) and dark brown (7.5YR 3/4) and few fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to weak medium angular blocky; firm; common dark gray (10YR 4/1) slickensides visible on faces of peds; neutral; clear smooth boundary.

Bg2—27 to 32 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) and dark brown (7.5YR 3/2) mottles; weak medium prismatic structure; firm; common dark gray (10YR 4/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

2Bg3—32 to 38 inches; dark gray (5Y 4/1) very fine sandy loam; common coarse prominent dark brown (7.5YR 3/4) mottles; weak medium prismatic structure; friable; neutral; clear smooth boundary.

2Cg—38 to 60 inches; dark gray (5Y 4/1) and gray (5Y 5/1) stratified very fine sandy loam and loamy very fine sand; common coarse prominent dark brown (7.5YR 3/4) and yellowish brown (10YR 5/4) mottles; massive; friable; neutral.

The solum ranges from 30 to 55 inches in thickness. The mollic epipedon is 10 to 16 inches thick.

The Ap and Bg horizons are silty clay loam or silty clay. The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is slightly acid or neutral. The 2Bg horizon is silt loam, loam, or very fine sandy loam. The 2Cg horizon is stratified loamy very fine sand to loam.

Muscatine Series

The Muscatine series consists of deep, somewhat poorly drained, moderately permeable soils on upland ridgetops and knolls. These soils formed in loess. Slopes range from 1 to 4 percent.

These soils have an argillic horizon, which is not definitive for the Muscatine series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Muscatine soils are similar to Atterberry, Downs, and Herrick soils and are commonly adjacent to Atterberry, Downs, Sable, and Virden soils. Atterberry soils do not have a mollic epipedon, are gently sloping, and are on knolls near drainageways. Downs soils are moderately well drained, do not have a mollic epipedon, and are on the narrower ridgetops and the higher knolls. Herrick soils have more clay in the subsoil than the Muscatine soils. Sable and Virden soils are poorly drained and are on broad flats and in upland drainageways below the Muscatine soils. Virden soils are finer textured in the Bt horizon than the Muscatine soils.

Typical pedon of Muscatine silt loam, 1 to 4 percent slopes, 1,640 feet east and 700 feet north of the southwest corner of sec. 5, T. 5 N., R. 8 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

A—8 to 15 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine and very fine subangular blocky structure parting to moderate fine granular; friable; neutral; clear smooth boundary.

Bt—15 to 20 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/8) mottles; moderate medium and fine subangular blocky structure; friable; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg1—20 to 27 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and common medium and fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg2—27 to 37 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6) and common medium and fine prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Btg3—37 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few very dark grayish brown (10YR 3/2) organic fillings in root channels; few medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Cg—49 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent strong brown (7.5YR 5/8) mottles; massive; friable; few very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) organic fillings in root channels; few medium rounded accumulations (iron and manganese oxides); neutral.

The thickness of the solum ranges from 40 to 60 inches. The depth to carbonates is 55 to 70 inches. The mollic epipedon is 12 to 20 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. It has a clay content of 27 to 35 percent. It is slightly acid or neutral. The Cg horizon is neutral or mildly alkaline.

Nameoki Series

The Nameoki series consists of deep, somewhat poorly drained soils on flood plains. These soils formed in clayey slack-water sediments and in the underlying stratified, loamy alluvium. They are very slowly permeable in the upper part and moderately permeable in the lower part. Slopes range from 0 to 3 percent.

Nameoki soils are similar to Darwin soils and are commonly adjacent to Landes and McFain soils. Darwin soils are poorly drained. Landes soils are well drained and formed in loamy alluvium over sandy alluvium. They are on the slightly higher parts of the flood plains. McFain soils are poorly drained and are in swales on bottom land below the Nameoki soils.

Typical pedon of Nameoki silty clay, 0 to 3 percent slopes, 390 feet north and 60 feet east of the southwest corner of sec. 10, T. 3 N., R. 9 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; moderate fine angular blocky structure; firm; neutral; abrupt smooth boundary.

A—6 to 11 inches; very dark gray (10YR 3/1) silty clay, gray (10YR 5/1) dry; strong fine and medium angular blocky and moderate fine subangular blocky structure; very firm; neutral; clear smooth boundary.

Bw1—11 to 16 inches; dark brown (10YR 3/3) silty clay; few fine faint yellowish brown (10YR 5/4) and grayish brown (10YR 5/2) mottles; strong medium angular blocky structure; very firm; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few dark grayish brown (10YR 4/2) pressure faces on peds; slightly acid; clear smooth boundary.

Bw2—16 to 23 inches; brown (10YR 4/3) silty clay; common medium faint light olive brown (2.5Y 5/4) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; extremely firm; common dark grayish brown (10YR 4/2) pressure faces on peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw3—23 to 32 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) silty clay; common fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; extremely firm; common dark grayish brown (10YR 4/2) pressure faces on peds; common very dark grayish brown (10YR 3/2) coatings on faces of peds; medium acid; clear smooth boundary.

2Bg1—32 to 39 inches; grayish brown (10YR 5/2) stratified silt loam and silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; common very dark grayish brown (10YR 3/2) coatings on faces of peds; strongly acid; clear smooth boundary.

2Bg2—39 to 45 inches; grayish brown (10YR 5/2) silt loam that has thin strata of silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure; firm; common very dark grayish brown (10YR 3/2) coatings on vertical faces of peds; medium acid; clear smooth boundary.

2Bg3—45 to 54 inches; grayish brown (10YR 5/2) very fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) coatings in root channels and wormholes and on some vertical faces of peds; medium acid; gradual smooth boundary.

2Cg—54 to 60 inches; grayish brown (10YR 5/2) silt loam that has thin strata of silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; massive; friable; slightly acid.

The thickness of the solum ranges from 40 to 65 inches. The depth to loamy alluvium is 24 to 40 inches. The mollic epipedon is 10 to 20 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silty clay loam or silty clay. The Bw horizon has value of 3 to 6 and chroma of 2 or 3 and has distinct mottles. It has a clay content of 40 to 65 percent. It is medium acid to neutral. The 2B and 2C horizons have value of 4 to 6 and chroma of 1 or 2. They are strongly acid to mildly alkaline. They are silt loam, very fine sandy loam, or silty clay loam. Stratification becomes more evident as depth increases.

Negley Series

The Negley series consists of deep, well drained, moderately permeable soils on side slopes on dissected uplands. These soils formed in glacial drift. Slopes range from 15 to 25 percent.

Negley soils are similar to Hickory and Pike soils and are commonly adjacent to those soils and to Rozetta and Wakeland soils. Hickory soils formed in Illinoian glacial till, have less gravel throughout than the Negley soils, and are on side slopes. Pike soils and the moderately well drained Rozetta soils formed in loess and are on ridgetops and side slopes above the Negley soils. Wakeland soils are somewhat poorly drained, formed in silty alluvium, and are on bottom land.

Typical pedon of Negley loam, 15 to 25 percent slopes, 540 feet west and 1,160 feet north of the southeast corner of sec. 4, T. 4 N., R. 5 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; less than 5 percent gravel; medium acid; clear smooth boundary.

E—3 to 7 inches; yellowish brown (10YR 5/4) loam, very pale brown (10YR 7/4) dry; weak fine granular structure; friable; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt1—7 to 12 inches; yellowish red (5YR 5/6) clay loam; moderate coarse subangular blocky structure; firm; common distinct reddish brown (5YR 4/4) clay films on faces of peds; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt2—12 to 22 inches; yellowish red (5YR 5/6) clay loam; moderate coarse subangular blocky structure; firm; many distinct reddish brown (5YR 4/4) clay films on faces of peds; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt3—22 to 32 inches; yellowish red (5YR 5/6) clay loam; moderate coarse subangular blocky structure; firm; many distinct reddish brown (5YR 4/4) clay films on faces of peds; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt4—32 to 39 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct yellowish red (5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct reddish brown (5YR 4/4) clay films on faces of peds; about 10 percent gravel; strongly acid; clear smooth boundary.

Bt5—39 to 50 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium distinct reddish brown (5YR 4/4) and reddish yellow (7.5YR 6/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct brown (7.5YR 5/4) clay films on faces of peds; about 10 percent gravel; medium acid; clear smooth boundary.

Bt6—50 to 60 inches; yellowish red (5YR 4/6) gravelly clay loam; common medium distinct reddish yellow (7.5YR 6/8) mottles; moderate coarse subangular blocky structure; firm; common distinct reddish brown (5YR 4/4) clay films on faces of peds; common fine irregular dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); about 25 percent gravel; medium acid.

The solum is more than 80 inches thick. The loess mantle is as much as 18 inches thick.

The A horizon has value of 4 or 5 and chroma of 2 or 3. It is commonly loam or silt loam, but in eroded areas it is clay loam. The E horizon has chroma of 2 to 5. It is loam or silt loam. The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. It is clay loam, sandy clay loam, or the gravelly analogs of these textures. It has a clay content of 27 to 35 percent. It is very strongly acid to medium acid.

Oakville Series

The Oakville series consists of deep, well drained, rapidly permeable soils on terraces. These soils formed in sandy alluvial sediments that commonly have been reworked by the wind. Slopes range from 1 to 10 percent.

Oakville soils are similar to Bloomfield soils and are commonly adjacent to Ambraw, Bloomfield, Onarga, and Ridgeville soils. Bloomfield soils have bands of fine sandy loam in the subsoil. They are in landscape positions similar to those of the Oakville soils. Ambraw soils are poorly drained and formed in loamy alluvium on bottom land. Onarga soils have a mollic epipedon, have more clay in the subsoil than the Oakville soils, and are on ridges. Ridgeville soils are somewhat poorly drained, have a mollic epipedon, and are in swales.

Typical pedon of Oakville fine sand, 5 to 10 percent slopes, 160 feet east and 1,970 feet south of the northwest corner of sec. 18, T. 4 N., R. 8 W.

Ap—0 to 11 inches; dark brown (10YR 4/3) fine sand, pale brown (10YR 6/3) dry; weak medium granular structure; loose; slightly acid; abrupt smooth boundary.

Bw1—11 to 23 inches; brown (7.5YR 4/4) fine sand; weak medium subangular blocky structure; loose; neutral; clear smooth boundary.

Bw2—23 to 32 inches; brown (7.5YR 4/4) fine sand; weak coarse subangular blocky structure; loose; neutral; clear smooth boundary.

C1—32 to 44 inches; brown (7.5YR 4/4) fine sand; single grain; loose; neutral; gradual smooth boundary.

C2—44 to 60 inches; brown (7.5YR 5/4) fine sand; single grain; loose; neutral.

The thickness of the solum ranges from 18 to 36 inches. The Ap horizon has value of 3 or 4 and chroma of 2 or 3. It is fine sand or loamy fine sand. The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is medium acid to neutral. The C horizon is slightly acid or neutral.

Oconee Series

The Oconee series consists of deep, somewhat poorly drained, slowly permeable soils on upland ridgetops and knolls. These soils formed in loess. Slopes range from 1 to 5 percent.

Oconee soils are similar to Cowden and Herrick soils and are commonly adjacent to Cowden, Darmstadt, Piasa, and Tamalco soils. Cowden and Piasa soils are poorly drained and are on flats slightly below the Oconee soils. Piasa soils have a natric horizon. Herrick soils have a mollic epipedon and are on the broader ridges. Darmstadt soils have a natric horizon. They occur as areas intricately mixed with areas of the Oconee soils on ridgetops. Tamalco soils are moderately well drained, have a natric horizon, and are on the higher ridgetops.

Typical pedon of Oconee silt loam, 1 to 5 percent slopes, 1,315 feet east and 2,245 feet north of the southwest corner of sec. 29, T. 5 N., R. 5 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure grading to weak thin platy in the lower part; very friable; common very fine tubular pores; slightly acid; abrupt smooth boundary.

E1—8 to 12 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate thick platy structure; very friable; few very fine tubular pores; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many brown (10YR 5/3) silt coatings occurring as fillings in pores; few fine irregular very dark gray (5YR 3/1) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

E2—12 to 16 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; common very fine pores; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; many brown (10YR 5/3) silt coatings occurring as fillings in pores; few fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

—16 to 21 inches; brown (10YR 5/3) silty clay loam (Bt); many medium distinct strong brown (7.5YR 5/6) and few fine faint dark yellowish brown (10YR 4/4) mottles; strong very fine subangular blocky structure; firm; common fine pores along interfaces between peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many prominent light brownish gray (10YR 6/2) silt coatings on faces of peds (E); few fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); strongly acid; clear irregular boundary.

Bt—21 to 29 inches; brown (10YR 5/3) silty clay; common medium distinct strong brown (7.5YR 5/8) and common medium faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to strong fine and medium angular blocky; very firm; few fine pores along interfaces between peds; many prominent dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded black (5YR 2/1) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg1—29 to 38 inches; grayish brown (10YR 5/2) silty clay; common medium distinct strong brown (7.5YR 5/8) and common coarse distinct brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few fine pores along interfaces between peds; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium rounded black (5YR 2/1) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg2—38 to 47 inches; grayish brown (2.5Y 5/2) silty clay loam; few medium prominent strong brown (7.5YR 5/6) and common medium distinct yellowish brown (10YR 5/8) and light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm; few fine pores along interfaces between peds; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium irregular black (5YR 2/1) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Btg3—47 to 58 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium and coarse prominent strong brown (7.5YR 5/8) and brownish yellow (10YR 6/8) mottles; weak coarse prismatic structure; firm; few fine pores along interfaces between peds; many faint grayish brown (10YR 5/2) clay films on faces of peds; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium irregular black (5YR 2/1) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Cg—58 to 60 inches; brown (10YR 5/3) silt loam; many medium distinct yellowish brown (10YR 5/8) and common medium distinct strong brown (7.5YR 5/6) mottles; massive; friable; few vertical cleavage planes; common very dark grayish brown (10YR

3/2) organic coatings on faces along cleavage planes; slightly acid.

The thickness of the solum ranges from 50 to 70 inches. The Ap horizon is 7 to 9 inches thick. It has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 or 2 and is mottled. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4 and has distinct mottles. It is silty loam or silty clay that has a clay content of 35 to 40 percent. This horizon is very strongly acid to slightly acid. The Cg horizon is medium acid to neutral.

Onarga Series

The Onarga series consists of deep, well drained soils on ridges. These soils formed in loamy and sandy alluvium. They are moderately rapidly permeable in the upper part and rapidly permeable in the lower part. Slopes range from 0 to 3 percent.

Onarga soils are similar to Landes soils and are commonly adjacent to Ambraw, Oakville, and Ridgeville soils. Landes soils do not have clay accumulation in the subsoil and are on the more recent alluvial ridges. Ambraw soils are poorly drained, are finer textured in the solum than the Onarga soils, and are on bottom land. Oakville soils formed in sandy alluvial sediments and are in positions on ridges similar to those of the Onarga soils. Ridgeville soils are somewhat poorly drained and are in swales on terraces.

Typical pedon of Onarga sandy loam, 0 to 3 percent slopes, 240 feet west and 2,520 feet south of the northeast corner of sec. 12, T. 4 N., R. 9 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—9 to 16 inches; very dark grayish brown (10YR 3/2) sandy loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; friable; common very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt1—16 to 22 inches; dark brown (10YR 4/3) sandy loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common distinct very dark gray (10YR 3/1) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—22 to 31 inches; strong brown (7.5YR 4/6) sandy loam; few medium faint reddish yellow (7.5YR 6/6) mottles; very weak medium prismatic structure parting to very weak medium subangular blocky; friable; few distinct dark brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.

BC—31 to 39 inches; strong brown (7.5YR 5/6) loamy sand; very weak medium prismatic structure; very friable; strongly acid; gradual smooth boundary.

C—39 to 60 inches; strong brown (7.5YR 5/6) fine sand; single grain; loose; medium acid.

The thickness of the solum ranges from 35 to 50 inches. The mollic epipedon is 12 to 24 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 3 or 4. It is sandy loam or loam that has a clay content of 15 to 18 percent. This horizon is strongly acid to slightly acid. The C horizon is fine sand or loamy fine sand.

Orion Series

The Orion series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land along the major streams and tributaries. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

These soils are taxadjuncts to the Orion series because they are mottled and have a dominant chroma of 2 within 20 inches of the surface. These differences, however, do not significantly affect the usefulness or behavior of the soils.

Orion soils are similar to Birds, Dupo, and Wakeland soils and are commonly adjacent to Birds, Dupo, and Worthen soils. Birds soils are poorly drained and are on the wider bottom land downstream from the Orion soils. Dupo soils have a silty clay buried soil within a depth of 40 inches. They are in landscape positions similar to those of the Orion soils. Wakeland soils do not have a dark buried soil within a depth of 60 inches. Worthen soils are well drained and moderately well drained, have a mollic epipedon, and are on alluvial fans.

Typical pedon of Orion silt loam, 300 feet east and 1,500 feet north of the center of sec. 30, T. 4 N., R. 6 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; very friable; slightly acid; abrupt smooth boundary.

C1—7 to 14 inches; grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; very friable; slightly acid; gradual smooth boundary.

C2—14 to 35 inches; stratified brown (10YR 5/3) and dark grayish brown (10YR 4/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and faint grayish brown (10YR 5/2) mottles; massive; very friable; medium acid; clear smooth boundary.

Ab1—35 to 46 inches; very dark gray (10YR 3/1) silt loam; few fine faint dark gray (10YR 4/1) mottles; weak medium subangular blocky structure; friable; slightly acid; clear smooth boundary.

Ab2—46 to 54 inches; very dark grayish brown (10YR 3/2) silt loam; few medium faint dark grayish brown (10YR 4/2) mottles; weak coarse subangular blocky structure; friable; slightly acid; gradual smooth boundary.

C'—54 to 60 inches; dark grayish brown (10YR 4/2) silt loam; common medium distinct light brownish gray (10YR 6/2) and dark gray (10YR 4/1) mottles; massive; friable; slightly acid.

The depth to the buried horizon ranges from 24 to 60 inches. The A horizon is 6 to 10 inches thick.

The Ap horizon has chroma of 2 or 3. The C horizon has value of 4 or 5 and chroma of 2 or 3. The Ab horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is silt loam or silty clay loam. The 10- to 40-inch control section has a clay content of 10 to 18 percent. Reaction ranges from medium acid to neutral throughout the profile.

Piasa Series

The Piasa series consists of deep, poorly drained, very slowly permeable soils on broad flats and in shallow depressions on uplands. These soils formed in loess high in content of sodium. Slopes range from 0 to 2 percent.

Piasa soils are commonly adjacent to Cowden, Darmstadt, Herrick, Oconee, and Virden soils. Cowden, Herrick, Oconee, and Virden soils do not have a natric horizon. Darmstadt, Herrick, and Oconee soils are somewhat poorly drained. Cowden, Herrick, and Virden soils occur as areas intricately mixed with areas of the Piasa soils. Darmstadt and Oconee soils are on the higher, more sloping parts of the landscape.

Typical pedon of Piasa silt loam, in an area of Cowden-Piasa silt loams, 80 feet north and 230 feet east of the southwest corner of sec. 28, T. 5 N., R. 5 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; very friable; few fine rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

A—7 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate thick platy structure; very friable; many dark grayish brown (10YR 4/2) silt coatings on faces of peds; common fine rounded yellowish red (5YR 4/8) accumulations (iron and manganese oxides); neutral; clear smooth boundary.

E—9 to 17 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine faint light olive brown (2.5Y 5/4) mottles; moderate fine and medium subangular blocky structure; very friable; very dark grayish brown (10YR 3/2) organic coatings on faces of peds and lining root channels; common medium rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); few medium rounded calcium carbonate concretions; neutral; clear smooth boundary.

Btg1—17 to 25 inches; grayish brown (2.5Y 5/2) silty clay; common medium faint light olive brown (2.5Y 5/6) and common fine distinct brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure parting to moderate fine and medium angular blocky; very firm; many distinct dark grayish brown (2.5Y 4/2) and dark gray (10YR 4/1) clay films on faces of peds; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular black (5YR 2/1) accumulations (iron and manganese oxides); common medium rounded calcium carbonate concretions; moderately alkaline; clear smooth boundary.

Btg2—25 to 36 inches; grayish brown (2.5Y 5/2) silty clay; common fine distinct brownish yellow (10YR 6/8) and common fine faint light olive brown (2.5Y 5/4) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; many distinct dark grayish brown (2.5Y 4/2) and dark gray (10YR 4/1) clay films on faces of peds; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular very dark gray (5YR 3/1) accumulations (iron and manganese oxides); common fine rounded calcium carbonate concretions; moderately alkaline; clear smooth boundary.

Btg3—36 to 45 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium rounded very dark gray (5YR 3/1) accumulations (iron and manganese oxides); few fine rounded calcium carbonate concretions; strongly alkaline; clear smooth boundary.

Btg4—45 to 53 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak very coarse prismatic structure; firm; many faint dark gray (10YR 4/1) clay films on faces of peds; few very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); moderately alkaline; gradual smooth boundary.

Btg5—53 to 60 inches; light olive gray (5Y 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/8) and common medium prominent brown (7.5YR 5/4) mottles; weak very coarse prismatic structure;

firm; many distinct dark gray (5Y 4/1) clay films on faces of peds; few medium irregular dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); moderately alkaline.

The thickness of the solum ranges from 40 to more than 60 inches. The dark surface soil is typically less than 10 inches thick but ranges to 17 inches. The depth to the natric horizon ranges from 10 to 20 inches.

The Ap horizon has value of 2 or 3 and chroma of 1 or 2. The E horizon has value of 4 or 5 and chroma of 1 or 2. It is medium acid to neutral. The Bt horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 2 or less. Its content of exchangeable sodium is more than 15 percent. This horizon is silty clay loam or silty clay and has a clay content of 35 to 42 percent. It is slightly acid to moderately alkaline in the upper part and mildly alkaline to strongly alkaline in the lower part.

The Piasa soils in the map units Virden-Piasa silt loams and Herrick-Piasa silt loams have a thicker dark A horizon than is definitive for the Piasa series. This difference, however, does not significantly affect the usefulness or behavior of the soils.

Pike Series

The Pike series consists of deep, well drained, moderately permeable soils on prominent ridges. These soils formed in loess and in the underlying glacial drift. Slopes range from 2 to 15 percent.

These soils have a higher pH and base saturation in the solum than is definitive for the Pike series. These differences, however, do not significantly affect the usefulness or behavior of the soils.

Pike soils are similar to Fayette soils and are commonly adjacent to Darmstadt, Herrick, and Oconee soils. Fayette soils formed in a loess mantle that is thicker than that of the Pike soils and are on ridges and side slopes. Darmstadt, Herrick, and Oconee soils are somewhat poorly drained and are on upland toe slopes below the Pike soils. Herrick and Oconee soils have a fine textured Bt horizon, and Darmstadt soils have a natric horizon.

Typical pedon of Pike silt loam, 5 to 10 percent slopes, eroded, 595 feet north and 660 feet east of the southwest corner of sec. 31, T. 4 N., R. 5 W.

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; mixed with yellowish brown silty clay loam from the subsoil; light yellowish brown (10YR 6/4) dry; weak medium granular structure; friable; neutral; abrupt smooth boundary.

Bt1—9 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate coarse subangular blocky structure parting to strong fine subangular blocky; firm; common medium roots inside peds; many distinct dark brown (10YR 4/3) clay films on faces of peds; few very dark gray (10YR 3/1) organic coatings lining root channels; common brown (10YR 5/3) silt coatings on faces of peds; slightly acid; clear smooth boundary.

Bt2—16 to 28 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots between peds; many distinct dark brown (10YR 4/3) clay films; common yellowish brown (10YR 5/4) silt coatings on faces of peds; common fine roots between peds; strongly acid; clear smooth boundary.

Bt3—28 to 36 inches; dark brown (7.5YR 4/4) silty clay loam; common fine distinct yellowish brown (10YR 5/4) mottles; moderate coarse prismatic structure; firm; common fine roots between peds; many distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; common dark brown (7.5YR 3/2) organic coatings lining root channels; common fine roots between peds; strongly acid; clear smooth boundary.

Bt4—36 to 45 inches; brown (7.5YR 5/4) silt loam; common fine distinct yellowish brown (10YR 5/6) and common medium distinct brown (10YR 5/3) mottles; moderate coarse prismatic structure; firm; common fine roots between peds; common distinct dark brown (7.5YR 4/4) clay films on faces of peds; few dark brown (7.5YR 3/2) organic coatings lining root channels; medium acid; gradual smooth boundary.

2Bt5—45 to 56 inches; dark brown (7.5YR 4/4) silt loam; common medium faint brown (7.5YR 5/4) mottles; weak coarse prismatic structure; firm; common fine roots between peds; few distinct reddish brown (5YR 4/3) clay films on faces of peds; common dark reddish brown (5YR 3/3) organic coatings lining root channels; few pebbles; medium acid; gradual smooth boundary.

2Bt6—56 to 60 inches; dark brown (7.5YR 4/4) silt loam; common medium prominent yellowish red (5YR 5/8) and few medium distinct reddish brown (5YR 5/3) mottles; weak coarse prismatic structure; friable; common fine roots between peds; few faint reddish brown (5YR 4/3) clay films on faces of peds; few dark reddish brown (5YR 3/3) organic coatings lining root channels; few pebbles; medium acid.

The thickness of the solum ranges from 60 to 90 inches. The depth to glacial drift ranges from 40 to 60 inches.

The Ap horizon has value of 4 or 5 and chroma of 3 of 4. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It has a clay content of 27 to 35 percent. It is very strongly acid to slightly acid. The 2Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4. It is silt loam, silty clay loam, or loam. It is strongly acid to slightly acid.

Raddle Series

The Raddle series consists of deep, well drained, moderately permeable soils on foot slopes and low terraces. These soils formed in silty colluvium on the foot slopes and silty alluvium on the terraces. Slopes range from 0 to 6 percent.

Raddle soils are similar to Lawson and Worthen soils and are commonly adjacent to Bold, Haymond, Sylvan, Tice, and Worthen soils. Lawson soils are somewhat poorly drained. Lawson and Worthen soils have a mollic epipedon that is thicker than that of the Raddle soils. Worthen soils are in landscape positions similar to those of the Raddle soils. Bold soils have a higher content of coarse silt and a lower content of clay than the Raddle soils. They are on side slopes in the uplands. Haymond soils have less clay in the control section than the Raddle soils and are on bottom land. Sylvan soils have more clay in the solum than the Raddle soils and are on side slopes in the uplands. Tice soils are somewhat poorly drained and are in the slightly lower positions on the landscape.

Typical pedon of Raddle silt loam, 0 to 3 percent slopes, 1,848 feet east and 3,168 feet north of the southwest corner of sec. 18, T. 4 N., R. 8 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

AB—8 to 16 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine granular structure; friable; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw1—16 to 27 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw2—27 to 42 inches; yellowish brown ®(10YR 5/4) silt loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; few dark brown (10YR 3/3) organic coatings on faces of peds; neutral; clear smooth boundary.

BC—42 to 60 inches; brown (10YR 5/3) silt loam; common fine faint grayish brown (10YR 5/2) and many fine distinct dark brown (7.5YR 3/4) mottles; weak medium prismatic structure; friable; few dark brown (10YR 3/3) organic coatings on faces of peds; neutral.

The thickness of the solum ranges from 40 to more than 60 inches. The mollic epipedon is 10 to 18 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 3 to 5 and chroma of 3 or 4. It has a clay content of 18 to 24 percent. It is medium acid to neutral.

Ridgeville Series

The Ridgeville series consists of deep, somewhat poorly drained soils on terraces. These soils formed in loamy and sandy alluvium. They are moderately permeable in the upper part and moderately rapidly permeable in the lower part. Slopes range from 0 to 2 percent.

Ridgeville soils are similar to La Hogue soils and are commonly adjacent to Ambraw, La Hogue, Oakville, and Onarga soils. Ambraw and La Hogue soils contain more clay in the subsoil than the Ridgeville soils. La Hogue soils are on terraces. Ambraw soils are poorly drained and are on bottom land. Oakville and Onarga soils are well drained and are on ridges above the Ridgeville soils. Oakville soils contain more sand and less clay in the subsoil than the Ridgeville soils.

Typical pedon of Ridgeville fine sandy loam, 60 feet south and 500 feet west of the northeast corner of sec. 30, T. 40 N., R. 8 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; neutral; abrupt smooth boundary.

Bt1—10 to 21 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium prominent reddish brown (5YR 4/4) and few fine distinct brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; many faint very dark grayish brown (10YR 3/2) clay films on faces of peds; neutral; clear smooth boundary.

Bt2—21 to 27 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium distinct dark brown (7.5YR 4/4) and few fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; friable; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—27 to 34 inches; brown (10YR 5/3) fine sandy loam; common medium distinct dark brown (7.5YR 4/4) and common fine distinct grayish brown (2.5Y 5/2) mottles; moderate coarse subangular blocky structure; friable; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; slightly acid; clear smooth boundary.

BC—34 to 44 inches; dark brown (7.5YR 4/4) loamy fine sand; common medium distinct pale brown (10YR 6/3) and common fine prominent grayish brown (2.5Y 5/2) mottles; weak coarse subangular blocky structure; very friable; neutral; gradual smooth boundary.

C1—44 to 53 inches; dark brown (7.5YR 4/4) fine sand; common coarse distinct pale brown (10YR 6/3) and

few fine distinct grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; loose; neutral; gradual smooth boundary.

C2—53 to 60 inches; brown (7.5YR 5/4) fine sand; common medium distinct pale brown (10YR 6/3) mottles; single grain; loose; neutral.

The A horizon is 10 to 16 inches thick. It has value of 2 or 3 and chroma of 1 or 2. The Bt horizon has value of 4 or 5 and chroma of 2 to 4. It is fine sandy loam, sandy clay loam, or loam. The average clay content in this horizon is 15 to 18 percent, but thin bands may have a clay content of 18 to 22 percent. The Bt, BC, and C horizons are slightly acid or neutral. The BC and C horizons have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6.

Riley Series

The Riley series consists of deep, somewhat poorly drained soils on low ridges. These soils formed in loamy and sandy alluvial sediments. They are moderately permeable in the upper part and rapidly permeable in the lower part. Slopes range from 0 to 3 percent.

Riley soils are similar to Ridgeville soils and are commonly adjacent to Beaucoup, Landes, and McFain soils. Ridgeville soils contain less clay in the subsoil than the Riley soils and contain less sand in the underlying material. Beaucoup soils formed in silty alluvium, are poorly drained, and are on bottom land below the Riley soils. Landes soils are well drained and are on the slightly higher ridges above the Riley soils. McFain soils are poorly drained, formed in clayey sediments, and are in swales on bottom land below the Riley soils.

Typical pedon of Riley clay loam, 0 to 3 percent slopes, 105 feet east of the center of sec. 13, T. 3 N., R. 9 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) clay loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; firm; common fine distinct strong brown (7.5YR 4/6) stains (iron oxide); medium acid; clear smooth boundary.

A—9 to 11 inches; very dark grayish brown (10YR 3/2) clay loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure; firm; common fine faint dark yellowish brown (10YR 4/4) stains (iron oxide); slightly acid; clear smooth boundary.

Bw—11 to 20 inches; dark grayish brown (10YR 4/2) sandy clay loam; common fine distinct dark brown (7.5YR 3/4) and many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; neutral; clear smooth boundary.

2BC—20 to 24 inches; dark brown (10YR 4/3) loamy sand; common medium distinct gray (10YR 5/1) mottles; weak medium subangular blocky structure; very friable; neutral; abrupt smooth boundary.

2C1—24 to 27 inches; dark yellowish brown (10YR 4/4) sand; common medium faint dark brown (7.5YR 3/4) and distinct grayish brown (10YR 5/2) mottles; single grain; loose; neutral; abrupt smooth boundary.

2C2—27 to 52 inches; pale brown (10YR 6/3) sand; common medium and coarse distinct brownish yellow (10YR 6/8), dark brown (10YR 3/3), and strong brown (7.5YR 4/6) mottles; single grain; loose; neutral; abrupt smooth boundary.

2C3—52 to 60 inches; grayish brown (10YR 5/2) sand; single grain; loose; mildly alkaline.

The thickness of the solum ranges from 20 to 30 inches. The mollic epipedon is 10 to 14 inches thick.

The Ap horizon has value of 2 or 3 and chroma of 1 to 3. It is loam or clay loam. The Bw horizon has a value of 4 to 6 and chroma of 2 to 4. The content of clay in this horizon is 24 to 35 percent, and the content of sand coarser than very fine sand is 20 to 60 percent. The 2C horizon is dominantly loamy fine sand, fine sand, or sand but commonly has thin lenses of silt loam, fine sandy loam, or silty clay loam.

Rozetta Series

The Rozetta series consists of deep, moderately well drained, moderately permeable soils on upland ridgetops and side slopes. These soils formed in loess. Slopes range from 2 to 15 percent.

Rozetta soils are similar to Elco, Fayette, and Stronghurst soils and are commonly adjacent to those soils and to Wakeland soils. Elco soils contain more sand in the lower part of the argillic horizon than the Rozetta soils. They are on side slopes in upstream areas. Fayette soils are well drained and are on the higher ridgetops and the more sloping side slopes. Stronghurst soils are somewhat poorly drained and are on the broader, less sloping ridgetops. Wakeland soils are somewhat poorly drained and formed in silty alluvium on bottom land below the Rozetta soils.

Typical pedon of Rozetta silt loam, 2 to 5 percent slopes, 248 feet east and 2,380 feet north of the southwest corner of sec. 15, T. 4 N., R. 8 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, very pale brown (10YR 7/3) dry; weak medium granular structure; friable; many fine and very fine roots inside peds; slightly acid; abrupt smooth boundary.

E—8 to 13 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak fine granular structure; friable; common fine and very fine roots inside peds; slightly acid; clear smooth boundary.

Bt1—13 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots between peds; common faint dark brown (10YR 4/3) clay

films on faces of peds; medium acid; clear smooth boundary.

Bt2—18 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine roots between peds; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few light brownish gray (10YR 6/2) silt coatings on faces of peds; few fine rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Bt3—27 to 36 inches; brown (10YR 5/3) silty clay loam; common medium faint light brownish gray (10YR 6/2) and common coarse distinct strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; many light brownish gray (10YR 6/2) silt coatings on faces of peds; common fine rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt4—36 to 48 inches; brown (10YR 5/3) silty clay loam; common coarse distinct light brownish gray (2.5Y 6/2) and brownish yellow (10YR 6/8) mottles; moderate coarse subangular blocky structure; firm; few very fine roots between peds; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt5—48 to 58 inches; brown (10YR 5/3) silty clay loam; many coarse distinct light brownish gray (2.5Y 6/2) and common coarse distinct yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few very fine roots between peds; few faint yellowish brown (10YR 5/4) clay films on faces of peds; few large rounded accumulations (iron and manganese oxides); medium acid; gradual smooth boundary.

C—58 to 60 inches; grayish brown (10YR 5/2) silt loam; many medium distinct brown (10YR 5/3) and strong brown (7.5YR 5/6) mottles; massive; friable; few medium rounded accumulations (iron and manganese oxides); slightly acid.

The solum generally ranges from 42 to 70 inches in thickness but is as thin as 24 inches in severely eroded areas. The Ap horizon has value of 4 or 5 and chroma of 2 or 3. It is silt loam dominantly but is silty clay loam in severely eroded areas. The E horizon has value of 4 to 6 and chroma of 2 or 3. The Bt horizon has a clay content of 27 to 35 percent. It has value of 4 or 5 and chroma of 3 or 4. The C horizon is slightly acid or neutral.

Rozetta silty clay loam, 2 to 5 percent slopes, severely eroded, has a thinner solum and a lower chroma in the lower part of the subsoil than is definitive for the Rozetta series. These differences, however, do not significantly affect the usefulness or behavior of the soil.

Rushville Series

The Rushville series consists of deep, poorly drained, very slowly permeable soils on flats and in depressions on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Rushville soils are similar to Cowden and Marine soils and are commonly adjacent to those soils and to Darmstadt and Huey soils. Cowden soils have a dark surface layer. They are in landscape positions similar to those of the Rushville soils. Marine soils are somewhat poorly drained and are on the slightly higher parts of broad ridgetops. Darmstadt soils are somewhat poorly drained, have a natric horizon, are gently sloping, and are on upland rises. Huey soils have a natric horizon and are in landscape positions similar to those of the Rushville soils.

Typical pedon of Rushville silt loam, 1,730 feet east and 80 feet south of the northwest corner of sec. 14, T. 4 N., R. 6 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; very friable; many distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; slightly acid; abrupt smooth boundary.

E1—8 to 12 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few medium faint yellowish brown (10YR 5/4) mottles; weak thin platy structure; very friable; many distinct light brownish gray (10YR 6/2) silt coatings on faces of peds; many fine rounded reddish brown (5YR 4/4) and dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

E2—12 to 20 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/1) dry; common medium distinct light olive brown (2.5Y 5/4) and few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate thick platy structure parting to weak fine subangular blocky; very friable; common faint very dark grayish brown (10YR 3/2) organic coatings lining root channels; common medium rounded black (5YR 2/1) accumulations (iron and manganese oxides); medium acid; abrupt smooth boundary.

Btg1—20 to 29 inches; light brownish gray (2.5Y 6/2) silty clay; common medium distinct yellowish brown (10YR 5/4) and few fine faint light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to strong fine and medium angular blocky; very firm; many prominent grayish brown (2.5Y 5/2) clay films on faces of peds; common medium rounded dark reddish brown (5YR 2/2)

accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg2—29 to 36 inches; light brownish gray (2.5Y 6/2) silty clay; common coarse distinct yellowish brown (10YR 5/6) mottles; strong medium prismatic structure parting to moderate medium angular blocky; very firm; many prominent grayish brown (2.5Y 5/2) clay films on faces of peds; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium irregular dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg3—36 to 44 inches; light brownish gray (2.5Y 6/2) silty clay loam; many coarse prominent strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common medium rounded black (5YR 2/1) accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg4—44 to 55 inches; light olive gray (5Y 6/2) silty clay loam; common coarse prominent strong brown (7.5YR 5/6) and common medium distinct light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common dark gray (10YR 4/1) organic coatings on faces of peds; common medium rounded black (5YR 2/1) accumulations (iron and manganese oxides); medium acid; gradual smooth boundary.

Btg5—55 to 60 inches; light olive gray (5Y 6/2) silty clay loam; common medium prominent brownish yellow (10YR 6/8) and yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; slightly acid.

The thickness of the solum ranges from 50 to 70 inches. The Ap horizon is 5 to 9 inches thick, and the E horizon is 5 to 12 inches thick. The Ap horizon has value of 4 to 6 and chroma of 1 or 2. It is silt loam or silt. The Bt horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam or silty clay and has a clay content of 38 to 45 percent. It is strongly acid or medium acid in the upper part and is medium acid or slightly acid in the lower part.

Sable Series

The Sable series consists of deep, poorly drained, moderately permeable soils on upland flats. These soils formed in loess. Slopes range from 0 to 2 percent.

Sable soils are similar to Virden soils and are commonly adjacent to Atterberry, Downs, and Muscatine soils. Virden soils have a fine textured Bt horizon. Atterberry and Muscatine soils are somewhat poorly drained, are gently sloping, and are on ridges and knolls. Atterberry soils do not have a mollic epipedon. Downs soils are moderately well drained and are on the more sloping ridges and knolls.

Typical pedon of Sable silty clay loam, 83 feet south and 1,230 feet east of the center of sec. 33, T. 5 N., R. 7 W.

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam; weak fine subangular blocky structure parting to moderate fine granular; friable; few fine and very fine roots; slightly acid; abrupt smooth boundary.

A—10 to 16 inches; very dark gray (10YR 3/1) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots; common fine and medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Bg1—16 to 28 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct light yellowish brown (2.5Y 6/4) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many very dark gray (10YR 3/1) organic coatings on faces of peds; common fine and medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Bg2—28 to 36 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine faint light brownish gray (2.5Y 6/2) and common fine distinct brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; common dark gray (10YR 4/1) organic coatings on faces of peds; few medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Bg3—36 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; moderate medium prismatic structure; firm; few medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

BCg—42 to 47 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium faint light yellowish brown (2.5Y 6/4) and common medium prominent strong brown (7.5YR 5/8) mottles; weak medium prismatic structure; friable; few medium rounded accumulations (iron and manganese oxides); slight effervescence; mildly alkaline; clear smooth boundary.

Cg—47 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common medium faint light yellowish brown (2.5Y 6/4) and common medium distinct brownish yellow (10YR 6/8) mottles; massive; friable; slight effervescence; mildly alkaline.

The thickness of the solum ranges from 40 to 55 inches. The thickness of the mollic epipedon ranges from 12 to 23 inches.

The A horizon has value of 2 or 3 and chroma of 1. The Bg horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. It is silty clay loam that has a clay content of 27 to 35 percent. This horizon is slightly acid or neutral. The BCg and Cg horizons are neutral or mildly alkaline.

Sarpy Variant

The Sarpy Variant consists of deep, moderately well drained soils on natural levees and ridges. These soils formed in recent sandy and silty alluvium. They are rapidly permeable in the upper part and moderately permeable in the lower part. Slopes range from 0 to 6 percent.

Sarpy Variant soils are similar to Landes and Oakville soils and are commonly adjacent to Darwin, Landes, and Riley soils. Landes soils have a mollic epipedon, are well drained, and formed in loamy alluvium over sandy alluvium. They are on the slightly higher ridges. Oakville soils are well drained and formed in sandy alluvium. They are on high terraces and are farther from the river than the Sarpy Variant soils. Darwin soils have a mollic epipedon, are poorly drained, and formed in clayey alluvium in swales and depressions on bottom land. Riley soils have a mollic epipedon, are somewhat poorly drained, and formed in loamy and sandy alluvium on low ridges.

Typical pedon of Sarpy Variant loamy fine sand, frequently flooded, 0 to 6 percent slopes, 2,310 feet north and 50 feet west of the southeast corner of sec. 36, T. 4 N., R. 10 W.

Ap—0 to 7 inches; dark brown (10YR 3/3) loamy fine sand, pale brown (10YR 6/3) dry; single grain; loose; neutral; abrupt smooth boundary.

C1—7 to 20 inches; light yellowish brown (2.5Y 6/4) very fine sand; single grain; loose; neutral; gradual smooth boundary.

C2—20 to 38 inches; light yellowish brown (2.5Y 6/4) loamy very fine sand; few fine distinct light olive brown (2.5Y 5/6) mottles; massive; very friable; slight effervescence; mildly alkaline; gradual smooth boundary.

C3—38 to 60 inches; pale brown (10YR 6/3) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; very friable; slight effervescence; mildly alkaline.

The Ap horizon has value of 3 to 5 and chroma of 1 to 3. It is fine sand or loamy fine sand. It is neutral or mildly alkaline. The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is fine sand, very fine sand, loamy fine sand, loamy very fine sand, or silt loam. It is neutral to moderately alkaline. In the lower part it has free carbonates and is slightly effervescent to strongly effervescent.

St. Charles Series

The St. Charles series consists of deep, moderately well drained, moderately permeable soils on terraces and ridgetops. These soils formed in silty material and in the underlying stratified outwash. Slopes range from 2 to 5 percent.

St. Charles soils are similar to Rozetta soils and are commonly adjacent to Colp, Kendall, Oakville, and Onarga soils. Rozetta soils formed in a loess mantle that is thicker than that of the St. Charles soils. They are on uplands. Colp soils are fine textured and are on the slightly lower terraces. The somewhat poorly drained Kendall soils also are on the slightly lower terraces. Oakville and Onarga soils are in positions on terraces similar to those of the St. Charles soils. Oakville soils formed in sandy sediments. Onarga soils formed in loamy and sandy sediments.

Typical pedon of St. Charles silt loam, 2 to 5 percent slopes, 1,980 feet west and 260 feet north of the center of sec. 1, T. 4 N., R. 9 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; strongly acid; abrupt smooth boundary.

E—7 to 12 inches; dark yellowish brown (10YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; moderate fine subangular blocky structure; friable; medium acid; clear smooth boundary.

BE—12 to 20 inches; dark brown (7.5YR 4/4) silt loam; few fine faint strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; medium acid; clear smooth boundary.

Bt1—20 to 29 inches; dark brown (7.5YR 4/4) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong fine subangular blocky; firm; many distinct dark brown (7.5YR 4/2) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—29 to 38 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark brown (7.5YR 4/4) clay films on faces of peds; many dark brown (7.5YR 3/2) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bt3—38 to 43 inches; yellowish brown (10YR 5/4) silty clay loam; few medium faint yellowish brown (10YR 5/6) and few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure; firm; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; many dark brown (7.5YR

3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

2Bt4—43 to 51 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; friable; common faint dark brown (7.5YR 4/4) clay films on faces of peds; few dark brown (7.5YR 3/2) organic coatings lining root channels; slightly acid; gradual smooth boundary.

2BC—51 to 60 inches; yellowish brown (10YR 5/4) stratified silt loam and very fine sandy loam; common fine faint grayish brown (10YR 5/2) and few medium faint yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; few faint brown (10YR 4/3) clay films lining root channels; slightly acid.

The solum ranges from 50 to more than 60 inches in thickness. The depth to stratified outwash ranges from 40 to 60 inches. The surface soil is 10 to 17 inches thick.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Bt and 2Bt horizons have value of 4 to 6 and chroma of 3 or 4. The Bt horizon ranges from medium acid in the upper part to neutral in the lower part. The control section has a clay content of 27 to 35 percent. The 2Bt horizon is fine sandy loam, very fine sandy loam, or loam and has strata of silt loam.

Stronghurst Series

The Stronghurst series consists of deep, somewhat poorly drained soils on broad upland ridgetops and knolls. These soils formed in loess. Permeability is moderate in the upper part of the profile, moderate or moderately slow in the next part, and moderate in the lower part. Slopes range from 0 to 5 percent.

Stronghurst soils are similar to Atterberry and Rozetta soils and are commonly adjacent to Fayette, Rozetta, and Rushville soils. Atterberry soils have a dark surface layer and are on the broader ridges. The well drained Fayette soils and the moderately well drained Rozetta soils are on the more sloping ridgetops and side slopes. The poorly drained Rushville soils have a fine textured Bt horizon and are in nearly level or depressional areas.

Typical pedon of Stronghurst silt loam, 2 to 5 percent slopes, 150 feet east and 2,520 feet north of the center of sec. 31, T. 3 N., R. 6 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; medium acid; abrupt smooth boundary.

E1—8 to 14 inches; grayish brown (10YR 5/2) silt loam; common fine faint yellowish brown (10YR 5/4) mottles; weak medium granular structure; friable; many very dark grayish brown (10YR 3/2) organic coatings lining root channels; few fine rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

E2—14 to 18 inches; grayish brown (10YR 5/2) silt loam; many medium faint yellowish brown (10YR 5/4) mottles; moderate fine and medium subangular blocky structure; friable; common dark brown (10YR 3/3) organic coatings lining root channels; few fine rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt1—18 to 30 inches; brown (10YR 5/3) silty clay loam; many medium distinct light brownish gray (2.5Y 6/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Bt2—30 to 37 inches; pale brown (10YR 6/3) silty clay loam; many medium distinct yellowish brown (10YR 5/8) and common medium distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); strongly acid; clear smooth boundary.

Btg—37 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxides) strongly acid; clear smooth boundary.

BCg—47 to 56 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded dark reddish brown (5YR 2/2) accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Cg—56 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent strong brown (7.5YR 5/8) and common fine distinct light olive brown (2.5Y 5/4) mottles; massive; friable; common dark grayish brown (10YR 4/2) coatings lining root channels; few fine rounded black (10YR 2/1) accumulations (iron and manganese oxides); medium acid.

The thickness of the solum ranges from 48 to more than 60 inches. The surface soil is 12 to 19 inches thick.

The Ap horizon has value of 4 or 5 and chroma of 1 or 2. The E horizon has value of 5 or 6 and chroma of 2 or 3. The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. It has a clay content of 30 to 34 percent. It is strongly acid to slightly acid.

Sylvan Series

The Sylvan series consists of deep, well drained, moderately permeable soils on upland side slopes. These soils formed in loess. Slopes range from 10 to 30 percent.

Sylvan soils are similar to Fayette soils and are commonly adjacent to Bold, Fayette, and Raddle soils. Fayette soils have a solum that is thicker than that of the Sylvan soils. They are on the less sloping ridgetops above the Sylvan soils. Bold soils have a higher content of coarse silt and a lower content of clay than the Sylvan soils. They have free carbonates at or near the surface and are downslope from the Sylvan soils. Raddle soils formed in silty alluvium on foot slopes below the Sylvan soils.

Typical pedon of Sylvan silt loam, in an area of Sylvan-Bold silt loams, 15 to 20 percent slopes, eroded, 290 feet east and 180 feet south of the northwest corner of sec. 28, T. 4 N., R. 8 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; medium acid; abrupt smooth boundary.

Bt1—8 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

Bt2—16 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct dark brown (7.5YR 4/4) clay films on faces of peds; medium acid; clear smooth boundary.

BC—23 to 30 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct light brownish gray (10YR 6/2) relict mottles; weak coarse subangular blocky structure; friable; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; gradual smooth boundary.

C—30 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common coarse prominent strong brown (7.5YR 5/6) relict mottles; massive; very friable; strong effervescence; moderately alkaline.

The thickness of the solum and the depth to carbonates range from 22 to 35 inches. The Ap horizon is 7 to 9 inches thick. It is silt loam or silty clay loam. It has a value of 4 and chroma of 2 or 3. The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 5. It is silt loam or silty clay loam that has a clay content of 25 to 35 percent. This horizon is medium acid to neutral.

Tamalco Series

The Tamalco series consists of deep, moderately well drained, very slowly permeable soils on upland ridgetops and knolls. These soils formed in loess high in content of sodium. Slopes range from 2 to 5 percent.

Tamalco soils are similar to Darmstadt soils and are commonly adjacent to Cowden, Darmstadt, Oconee, and Piasa soils. Darmstadt soils are somewhat poorly drained and are on the lower ridges and side slopes. Cowden and Piasa soils are poorly drained, have a dark surface layer, are nearly level, and are on broad flats. Also, Cowden soils do not have a natric horizon. Oconee soils are somewhat poorly drained, are gently sloping, and are on ridges. They have a dark surface layer and do not have a natric horizon.

Typical pedon of Tamalco silt loam, 2 to 5 percent slopes, eroded, 1,140 feet east and 330 feet south of the center of sec. 17, T. 5 N., R. 5 W.

Ap—0 to 9 inches; dark brown (10YR 4/3) silt loam; mixed with brown (7.5YR 4/4) silty clay from the subsoil; pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine and medium rounded accumulations (iron and manganese oxides); neutral; abrupt smooth boundary.

Bt1—9 to 13 inches; brown (7.5YR 4/4) silty clay; strong fine subangular blocky structure; very firm; many prominent reddish brown (5YR 4/4) clay films on faces of peds; strongly acid; abrupt smooth boundary.

Bt2—13 to 19 inches; brown (10YR 5/3) silty clay loam; common medium distinct brown (7.5YR 4/4) and reddish brown (5YR 4/4) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; many prominent brown (7.5YR 4/4) clay films on faces of peds; few fine rounded accumulations (iron and manganese oxides); few black (5YR 2/1) stains on vertical faces of peds and lining root channels; neutral; clear smooth boundary.

Bt3—19 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; common coarse distinct light brownish gray (10YR 6/2) and common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure; firm; common distinct dark brown (10YR 4/3) clay films on faces of peds; many dark brown (7.5YR 3/2) organic coatings lining root channels; common fine and medium rounded accumulations (iron and manganese oxides); few coarse irregular calcium carbonate accumulations; moderately alkaline; clear smooth boundary.

BC—28 to 39 inches; light brownish gray (10YR 6/2) silt loam; many medium prominent strong brown (7.5YR 5/8) mottles; moderate coarse prismatic structure; friable; common black (N 2/0) stains on vertical faces of peds; common brown (7.5YR 5/2) silt coatings on faces of peds; common fine and medium rounded accumulations (iron and manganese oxides); few coarse irregular calcium

carbonate concretions; moderately alkaline; gradual smooth boundary.

C1—39 to 53 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; common very coarse prismatic structure; friable; many brown (10YR 5/3) silt coatings on faces of peds; moderately alkaline; clear smooth boundary.

C2—53 to 60 inches; brown (7.5YR 5/4) silt loam; common medium faint brown (7.5YR 5/2) and distinct strong brown (7.5YR 5/8) mottles; weak very coarse prismatic structure; friable; brown (10YR 5/3) silt coatings on faces of peds; common medium rounded accumulations (iron and manganese oxides); moderately alkaline.

The thickness of the solum ranges from 39 to 55 inches. The A horizon is 5 to 9 inches thick. The depth to the natric horizon ranges from 12 to 24 inches.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The part of the Bt horizon above the natric horizon averages clay content of more than 35 percent clay and is silty clay loam or silty clay. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The lower part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It is neutral to moderately alkaline.

Tice Series

The Tice series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Tice soils are similar to Beaucoup soils and are commonly adjacent to Beaucoup, Birds, Landes, and Wakeland soils. Beaucoup and Birds soils are poorly drained and are on the lower parts of the bottom land. Birds soils have a surface layer that is lighter colored than that of the Tice soils. Landes soils are well drained, formed in loamy alluvium over sandy alluvium, and are on the slightly higher parts of the bottom land. Wakeland soils have a surface layer that is lighter colored than that of the Tice soils. They are in positions on bottom land similar to those of the Tice soils.

Typical pedon of Tice silt loam, 2,335 feet south and 680 feet west of the northeast corner of sec. 27, T. 4 N., R. 9 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine and medium granular structure; firm; slightly acid; clear smooth boundary.

A—8 to 16 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine subangular blocky structure; firm; medium acid; clear smooth boundary.

BA—16 to 23 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; common fine faint dark yellowish brown (10YR 4/4) mottles; strong fine prismatic structure; firm; many very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bw—23 to 33 inches; dark brown (10YR 4/3) silty clay loam; common fine distinct grayish brown (10YR 5/2) and dark yellowish brown (10YR 4/6) mottles; moderate fine and medium prismatic structure; firm; many very dark gray (10YR 3/1) organic coatings on faces of peds; medium acid; clear smooth boundary.

Bg—33 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and few fine faint light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure; firm; many very dark gray (10YR 3/1) organic coatings on faces of peds; common dark grayish brown (10YR 4/2) pressure faces on peds; medium acid; clear smooth boundary.

BCg—41 to 52 inches; grayish brown (2.5Y 5/2) silt loam that has thin lenses of loam; common coarse distinct yellowish brown (10YR 5/8) and common fine faint light olive brown (2.5Y 5/4) mottles; moderate medium and coarse subangular blocky structure; firm; few dark grayish brown (10YR 4/2) pressure on faces of peds; slightly acid; clear smooth boundary.

Cg1—52 to 58 inches; mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/8), and light olive brown (2.5Y 5/4) silt loam; weak coarse subangular blocky structure; friable; slightly acid; gradual smooth boundary.

Cg—58 to 60 inches; mottled light brownish gray (2.5Y 6/2) and light olive brown (2.5Y 5/4) silt loam that has thin strata of very fine sandy loam; massive; very friable; neutral.

The thickness of the solum ranges from 35 to 60 inches. The mollic epipedon is 12 to 24 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The Bw horizon has value of 4 or 5 and chroma of 2 or 3. The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2. The 10- to 40-inch control section has a clay content of 27 to 35 percent. The B horizon is medium acid to neutral. The Cg horizon is silt loam that has strata of very fine sandy loam or silty clay loam.

Virden Series

The Virden series consists of deep, poorly drained, moderately slow permeable soils on interstream divides and broad upland flats. These soils formed in loess. Slopes range from 0 to 2 percent.

Virden soils are similar to Herrick and Sable soils and are commonly adjacent to Harrison, Herrick, Muscatine, and Piasa soils. Herrick soils are somewhat poorly drained, are nearly level, and are on flats on the slightly

higher parts of the landscape. Sable soils have less clay in the subsoil than the Virden soils. Harrison soils are moderately well drained, contain less clay in the subsoil than the Virden soils, and are on the higher, more sloping ridges. Muscatine soils are somewhat poorly drained, have less clay in the subsoil than the Virden soils, are gently sloping, and are on rises. Piasa soils have a natric horizon and are in slight depressions.

Typical pedon of Virden silty clay loam, 400 feet west and 1,390 feet north of the southeast corner of sec. 6, T. 5 N., R. 8 W.

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium granular structure; friable; neutral; clear smooth boundary.

AB—9 to 15 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; common fine distinct grayish brown (10YR 5/2) mottles; moderate fine subangular blocky structure; firm; slightly acid; clear smooth boundary.

Bt—15 to 23 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; many black (10YR 2/1) organic coatings on faces of peds; common medium rounded accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg1—23 to 34 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common faint very dark gray (10YR 3/1) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg2—34 to 44 inches; grayish brown (2.5Y 5/2) silty clay loam; many fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium prismatic structure; firm; common faint very dark gray (2.5Y 3/1) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); slightly acid; clear smooth boundary.

Btg3—44 to 55 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; common faint very dark gray (2.5Y 3/1) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); neutral; clear smooth boundary.

Cg—55 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; black (10YR 2/1) krotovinas; neutral.

The solum is 48 to 60 inches thick. The mollic epipedon is 12 to 24 inches thick.

The A horizon has value of 2 or 3 and chroma of 1 or 2. It is silt loam or silty clay loam. The Btg horizon is silty clay loam or silty clay and has a clay content of 35 to 40 percent. It has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is medium acid to neutral. The Cg horizon is silt loam or silty clay loam. It is neutral or mildly alkaline.

Wakeland Series

The Wakeland series consists of deep, somewhat poorly drained, moderately permeable soils on bottom land along the major streams and their tributaries. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

Wakeland soils are similar to Orion soils and are commonly adjacent to Birds, Fayette, Hickory, and Worthen soils. Orion soils have a dark buried soil within a depth of 60 inches. They are in positions on bottom land similar to those of the Wakeland soils. Birds soils are poorly drained and are on the wider bottom land downstream from the Wakeland soils. Fayette and Hickory soils are well drained and are on side slopes above the Wakeland soils. Fayette soils formed in loess, and Hickory soils formed in glacial drift. Worthen soils are moderately well drained and well drained, have a mollic epipedon, and are on alluvial fans.

Typical pedon of Wakeland silt loam, 1,600 feet north and 1,330 feet east of the center of sec. 34, T. 4 N., R. 5 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; very thin lenses of light gray (10YR 7/1) clean silt and very fine sand; weak fine granular structure; friable; neutral; clear smooth boundary.

Cg1—8 to 34 inches; dark grayish brown (10YR 4/2) silt loam; few fine distinct yellowish brown (10YR 5/8) mottles; massive; friable; neutral; gradual smooth boundary.

Cg2—34 to 44 inches; dark grayish brown (10YR 4/2) silt loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; massive; friable; neutral; clear smooth boundary.

Cg3—44 to 60 inches; grayish brown (10YR 5/2) silt loam; common medium faint dark grayish brown (10YR 4/2) and light brownish gray (10YR 6/2) and common fine distinct strong brown (7.5YR 5/6) mottles; massive; friable; few medium rounded dark brown (7.5YR 3/2) accumulations (iron and manganese oxides); slightly acid.

The Ap horizon has value of 4 or 5 and chroma of 2 or 3. The Cg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 3 and has distinct mottles with higher chroma. The content of clay in the 10- to 40-inch control

section is 12 to 18 percent, and the content of fine and coarse sand is less than 15 percent. Reaction ranges from medium acid to neutral throughout the profile.

Weir Series

The Weir series consists of deep, poorly drained, very slowly permeable soils on flats and in depressions on uplands. These soils formed in loess. Slopes range from 0 to 2 percent.

Weir soils are similar to Marine and Rushville soils and are commonly adjacent to Marine, Rozetta, and Stronghurst soils. The somewhat poorly drained Marine soils are on the slightly higher broad ridgetops. Rushville soils abruptly increase in clay content in the upper part of the subsoil. The moderately well drained Rozetta soils and the somewhat poorly drained Stronghurst soils have less clay in the subsoil than the Weir soils and are on the more sloping ridgetops and side slopes.

Typical pedon of Weir silt loam, 1,410 feet east and 15 feet south of the northwest corner of sec. 26, T. 4 N., R. 7 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; few fine rounded accumulations (iron and manganese oxides); medium acid; abrupt smooth boundary.

E1—8 to 16 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine faint yellowish brown (10YR 5/4) mottles; weak medium platy structure; friable; many light brownish gray (10YR 6/2) silt coatings on faces of peds and lining root channels; medium acid; clear smooth boundary.

E2—16 to 22 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/2) dry; few fine distinct olive brown (2.5Y 4/4) mottles; weak medium subangular blocky structure parting to weak fine and medium granular; friable; common light gray (10YR 7/1) silt coatings on faces of peds and lining root channels; few fine rounded accumulations (iron and manganese oxides); medium acid; clear smooth boundary.

Btg1—22 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium angular blocky structure parting to strong fine angular blocky; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; many grayish brown (10YR 5/2) and light gray (10YR 7/1) silt coatings on faces of peds; few fine rounded accumulations (iron and manganese oxides); very strongly acid; abrupt smooth boundary.

Btg2—28 to 34 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; common prominent grayish brown (2.5Y 5/2) clay films on faces of peds; few distinct light brownish gray (2.5Y 6/2) silt coatings on faces of peds; few medium rounded accumulations (iron and manganese oxides); very strongly acid; gradual smooth boundary.

Btg3—34 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate coarse prismatic structure parting to moderate medium angular blocky; very firm; common prominent grayish brown (2.5Y 5/2) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

Btg4—42 to 50 inches; light brownish gray (2.5Y 6/2) silty clay loam; common coarse distinct yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common medium rounded accumulations (iron and manganese oxides); strongly acid; gradual smooth boundary.

Btg5—50 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few medium rounded accumulations (iron and manganese oxides); slightly acid.

The solum is 50 to 60 inches thick. The Ap horizon has value of 4 and chroma of 1 or 2. The E horizon has value of 5 or 6 and chroma of 2 and has mottles. The Btg horizon has value of 4 to 6 and chroma of 1 or 2 and has mottles. It is very strongly acid or strongly acid in the upper part and strongly acid to slightly acid in the lower part. It has a clay content of 35 to 40 percent in the upper part but grades to silt loam in the lower part.

Worthen Series

The Worthen series consists of deep, well drained and moderately well drained, moderately permeable soils on foot slopes and terraces. These soils formed in silty colluvium on the foot slopes and silty alluvium on the terraces. Slopes range from 0 to 5 percent.

Worthen soils are similar to Lawson and Raddle soils and are commonly adjacent to Bold, Raddle, Sylvan, and Tice soils. Lawson soils are somewhat poorly drained. Raddle and Tice soils have a mollic epipedon that is thinner than that of the Worthen soils. Raddle soils are on terraces and foot slopes. Tice soils are somewhat poorly drained and are on bottom land. Bold and Sylvan soils do not have a mollic epipedon, formed in loess, and are on upland side slopes.

Typical pedon of Worthen silt loam, 0 to 2 percent slopes, 2,376 feet west and 270 feet south of the northeast corner of sec. 29, T. 4 N., R. 8 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

A—10 to 20 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine and medium subangular blocky structure; friable; neutral; clear smooth boundary.

Bw1—20 to 29 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate medium subangular blocky structure; friable; many very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bw2—29 to 37 inches; brown (10YR 4/3) silt loam; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; many very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BC—37 to 48 inches; brown (10YR 4/3) silt loam; common fine distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; common dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; gradual smooth boundary.

C—48 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct brown (10YR 4/3) and yellowish brown (10YR 5/6) mottles; massive; friable; slightly acid.

The thickness of the solum ranges from 35 to 60 inches. The mollic epipedon is 24 to 37 inches thick and extends into the Bw horizon.

The A horizon has value of 2 or 3 and chroma of 1 to 3. The Bw horizon has value of 3 to 5 and chroma of 3 or 4 and has mottles with higher chroma in the lower part. It is slightly acid or neutral. The control section has a clay content of 18 to 24 percent. The C horizon is slightly acid to mildly alkaline.

Formation of the Soils

This section relates the factors of soil formation to the soils in Madison County.

Soils are a product of the environment in which they formed. They are the result of interactions among soil-forming processes (*8*). The characteristics of a soil at any given time are determined by (1) the physical and mineralogical composition of the parent material; (2) the climate under which the soil material has accumulated and existed since accumulation; (3) the native vegetation and animal life on and in the soil; (4) the relief, or lay of the land: and (5) the time that the forces of soil formation have acted on the soil material.

Climate, vegetation, and animal life are active factors of soil formation. Over time, they act on the parent material, which has accumulated through the weathering of rocks, and slowly change the material into a natural body that has genetically related horizons. The effects of climate, vegetation, and animal life are conditioned by relief. The parent material affects the kind of soil profile that forms and in a few cases determines it almost entirely. Time is needed to change parent material into a soil. The five factors of soil formation are closely interrelated. The effects of any one factor can be described only as they relate to the other factors.

Parent Material

The major kinds of parent material in Madison County are loess, glacial till, glacial drift, colluvium, and alluvium (fig. 10). These unconsolidated materials have affected the mineralogical and chemical nature of the soils. To a large extent, they also have determined the rate of soil formation.

Most of the soils in the county formed entirely in loess, or wind-deposited material. The primary source of the loess was the flood plains along the Mississippi and Missouri Rivers. In most upland areas, the loess overlies the other kinds of parent material. It is thickest, about 80 feet thick, along the bluffs near the town of Collinsville. It thins rapidly eastward and is only about 5 feet thick in the northeastern part of the county. The upper two-thirds of the loess is Peorian Loess, which is yellowish brown or buff colored. The lower third is Roxana Silt, which is strong brown and has a higher content of coarse silt than the Peorian Loess. Fayette, Marine, and Cowden are examples of extensive soils that formed in loess.

Alluvium is material deposited by moving water. Its texture in any given area is determined by the velocity of the water that deposited it. Alluvium is on the bottom land along Silver Creek, Cahokia Creek, and other streams in the county. It is mostly silt loam and some silty clay loam. It was deposited as strata of silt loam or of silt loam and silty clay loam. Birds, Orion, and Wakeland are examples of soils that formed in this alluvium.

The American Bottoms, which are along the Mississippi River, have the largest area of alluvial soils. The alluvium on these bottoms is less uniform than that along the other streams in the county. It is on a series of terrace ridges and swales west of Long Lake Slough. The alluvium on the ridges is mainly loamy or sandy. Landes and Riley soils and the Sarpy Variant are examples of soils on the ridges. The upper sediments in the swales are silty clay loam and silty clay. The lower sediments are loamy. Nameoki and McFain soils are in these areas. The nearly level bottom land east of Long Lake Slough has silty clay slack-water sediments. Darwin soils are the dominant soils on this bottom land. A series of terraces rises above this bottom land. The texture of the soils on these terraces ranges from fine sand to silty clay. Bloomfield, Colp, and Kendall are examples of soils on the terraces. Colluvium lies along the base of the bluffs on the flood plains that are along the Mississippi River. This material is mainly silt loam. Worthen and Raddle are examples of soils that formed in this material.

Glacial drift underlies the soils on uplands. It is from the Vandalia Till and Hagarstown members of the Glasford Formation of Illinoian age. The Vandalia Till member is of largest extent. It consists of loamy material that was transported and deposited by the Illinoian ice sheet. The Hagarstown member was deposited and reworked by glacial meltwater in crevices of the ice sheet. It commonly overlies the Vandalia Till member. It can be distinguished by coarser textures and redder colors throughout. Many of the prominent oval and oblong ridges in the county have cores consisting of Hagarstown drift. Harrison and Pike are examples of soils that formed on these ridges.

Vandalia Till and the overlying Sangamon paleosol are common on the side slopes that are along drainageways. Hickory soils formed partly in Vandalia Till, and Atlas soils formed partly in the Sangamon paleosol.

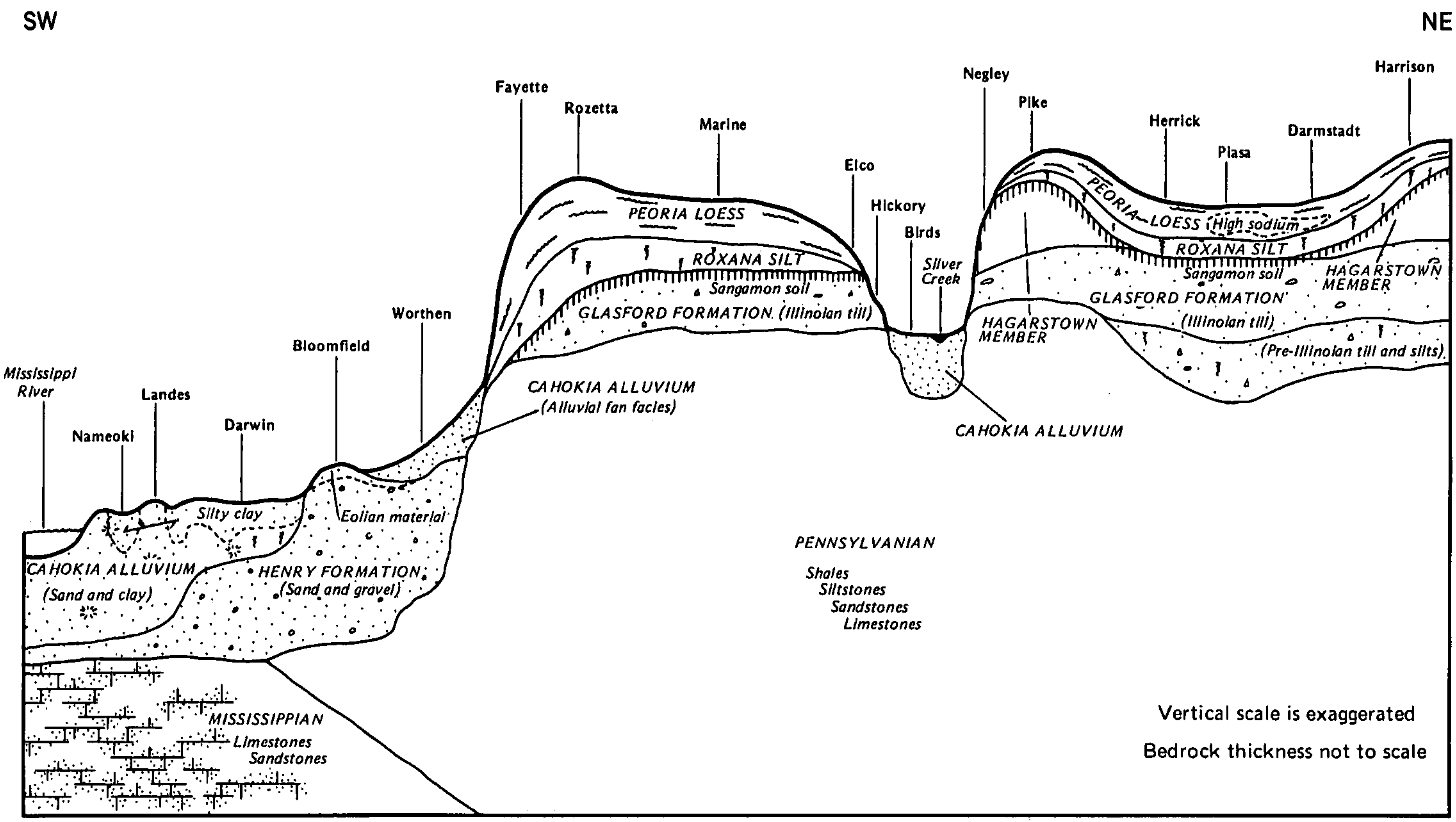


Figure 10.—Generalized geologic cross section of the parent material of some representative soils in Madison County.

Climate

The survey area has a temperate, humid, continental climate. The climate has very important effects on weathering, vegetation, and erosion. Temperature and precipitation affect the physical and chemical nature of the soil. The weathering of minerals in the soil increases as the temperature increases. As water from precipitation moves through the soil, soluable salts are dissolved and transported downward. The water also transports clay-size particles downward in the soil. A clay-enriched subsoil is the result of this translocation of clay. Climate also affects soil formation indirectly through its interaction with the vegetation on the soil. The temperature and precipitation in the Madison County survey area favor both prairie grasses and forest vegetation.

Precipitation can affect soil formation by removing soil at the surface. As the rate of erosion approaches the rate of soil formation, the soil generally exhibits less profile development. Additional information about the climate is available under the heading "General Nature of the County."

Vegetation and Animal Life

Soils are affected by the vegetation under which they formed. The native vegetation in the survey area was mainly deciduous hardwood trees and prairie grasses. Soils are commonly grouped as either forest soils or prairie soils. Forest soils have a thin, relatively light colored surface layer. The organic matter in the surface layer is mainly from the decomposition of leaf litter. Hickory and Rushville soils formed under forest vegetation. Prairie soils have a thick, dark surface layer. Grasses have many fine, fibrous roots in the upper part. These roots add large amounts of organic matter to the soil when they die and decompose. Herrick and Virden soils formed under grasses.

Other living organisms have also contributed to the formation of soils. These include micro-organisms, bacteria, fungi, earthworms, insects, and burrowing animals. They help to decompose the organic material and mix and churn the soil.

Human activities also affect the formation of soils. In some areas farming reduces the amount of organic matter in the surface soil and increases or decreases the amount of runoff and erosion from a particular soil. Dikes and levees reduce the frequency of flooding on some

soils. The water table in some soils has been lowered by subsurface drains. The future formation of some soils could be greatly affected by human activities.

Relief

Relief tends to modify the effects of the other soil-forming factors. It controls the amount of water in the soil through its effect on runoff and infiltration.

Natural drainage generally is closely associated with slope or relief. The more sloping soils on uplands are well drained and have a brown and yellowish brown subsoil. Fayette and Hickory soils are examples. Soils in low landscape positions, such as shallow depressions, and nearly level soils on broad plains are poorly drained and have a gray subsoil. Cowden and Rushville soils are examples. Soils in intermediate landscape positions, such as low ridges and gently sloping side slopes, are somewhat poorly drained and have a mixed or mottled, gray and brown subsoil. Oconee and Marine soils are examples.

Relief influences the runoff rate and the susceptibility to erosion, both of which generally increase as the slope increases. In some areas runoff and erosion are so rapid that little soil formation can occur. The soils in these areas are calcareous throughout and have a thin solum. Bold soils are an example.

Time

Time is necessary for the other soil-forming factors to interact. Soil profiles normally become more strongly expressed with increased exposure to weathering processes. The influence of time, however, can be modified by deposition of material and by topography. Soils on bottom land, such as Birds and Wakeland soils, accumulate surface deposits each time they are flooded. These weakly developed soils are much younger than the other soils in the county.

Because slope affects the amount of water that enters the soil, the extent of profile development generally decreases as the slope increases. Therefore, nearly level soils in upland areas commonly are genetically and morphologically older than soils in the more sloping areas.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods

during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.
Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.
Silica. A combination of silicon and oxygen. The mineral form is called quartz.
Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
Siltstone. Sedimentary rock made up of dominantly silt-sized particles.
Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.
Sinkhole. A depression in the landscape where limestone has been dissolved.
Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.
Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.
Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.
Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multipled by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.
Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.
Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.
Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.
Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.
Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.
Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.
Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.
Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).
Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.
Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.
Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.
Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.
Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data were recorded in the period 1951-78 at Alton Dam]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	^{o}F	^{o}F	^{o}F	^{o}F	^{o}F	Units	In	In	In		In
January----	36.7	19.3	28.1	65	-7	31	1.72	0.70	2.57	5	4.1
February---	41.9	23.9	32.9	68	0	51	2.20	.94	3.26	5	4.2
March------	51.7	32.3	42.0	80	10	190	3.30	1.84	4.59	7	4.6
April------	65.5	44.9	55.3	88	27	459	3.84	2.07	5.39	8	.2
May--------	75.6	55.0	65.3	92	37	784	4.28	2.30	6.01	8	.0
June-------	84.9	64.5	74.7	97	50	1,041	3.93	1.92	5.67	6	.0
July-------	88.6	68.6	78.6	100	55	1,197	3.81	1.91	5.45	6	.0
August-----	86.8	66.4	76.6	99	53	1,135	2.96	1.27	4.39	5	.0
September--	80.2	58.3	69.3	96	42	879	2.92	1.42	4.22	5	.0
October----	68.5	46.9	57.7	88	30	549	2.49	.97	3.75	5	.0
November---	53.2	35.1	44.2	77	12	178	2.84	1.35	4.11	6	1.2
December---	41.1	25.0	33.1	68	-1	48	2.53	.88	3.89	6	2.0
Yearly:											
Average--	64.6	45.0	54.8	---	---	---	---	---	---	---	---
Extreme--	---	---	---	102	-9	---	---	---	---	---	---
Total----	---	---	---	---	---	6,542	36.82	30.69	42.65	72	16.3

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-78 at Alton Dam]

Probability	Temperature		
	24^{o} F or lower	28^{o} F or lower	32^{o} F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 1	April 10	April 22
2 years in 10 later than--	March 27	April 4	April 17
5 years in 10 later than--	March 16	March 25	April 7
First freezing temperature in fall:			
1 year in 10 earlier than--	November 4	October 25	October 20
2 years in 10 earlier than--	November 10	October 30	October 25
5 years in 10 earlier than--	November 21	November 10	November 3

TABLE 3.--GROWING SEASON

[Data were recorded in the period 1951-78 at Alton Dam]

Probability	Daily minimum temperature during growing season		
	Higher than 24^{o} F	Higher than 28^{o} F	Higher than 32^{o} F
	Days	Days	Days
9 years in 10	225	203	187
8 years in 10	233	212	195
5 years in 10	248	229	210
2 years in 10	264	246	225
1 year in 10	272	255	233

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
7D3	Atlas silty clay loam, 10 to 15 percent slopes, severely eroded	935	0.2
8E3	Hickory clay loam, 12 to 20 percent slopes, severely eroded	5,125	1.1
8F	Hickory silt loam, 15 to 30 percent slopes	20,125	4.3
16	Rushville silt loam	2,375	0.5
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded	515	0.1
35F	Bold silt loam, 15 to 30 percent slopes	620	0.1
37A	Worthen silt loam, 0 to 2 percent slopes	1,110	0.2
37B	Worthen silt loam, 2 to 5 percent slopes	405	0.1
41B	Muscatine silt loam, 1 to 4 percent slopes	9,230	1.9
46A	Herrick silt loam, 0 to 3 percent slopes	8,100	1.7
50	Virden silty clay loam	7,720	1.6
53B	Bloomfield loamy fine sand, 1 to 3 percent slopes	625	0.1
61B	Atterberry silt loam, 1 to 4 percent slopes	4,670	1.0
68	Sable silty clay loam	1,345	0.3
70	Beaucoup silty clay loam	4,765	1.0
71	Darwin silty clay	12,465	2.7
78	Arenzville silt loam	410	0.1
102A	La Hogue loam, 0 to 3 percent slopes	310	0.1
113B	Oconee silt loam, 1 to 5 percent slopes	7,395	1.6
119C3	Elco silty clay loam, 5 to 10 percent slopes, severely eroded	5,480	1.1
119D2	Elco silt loam, 10 to 15 percent slopes, eroded	2,495	0.5
119D3	Elco silty clay loam, 10 to 15 percent slopes, severely eroded	4,440	0.9
120	Huey silt loam	4,155	0.9
122B	Colp silt loam, 1 to 4 percent slopes	310	0.1
122C3	Colp silty clay loam, 4 to 10 percent slopes, severely eroded	220	*
127B	Harrison silt loam, 2 to 5 percent slopes	1,280	0.3
127C2	Harrison silt loam, 5 to 10 percent slopes, eroded	530	0.1
150A	Onarga sandy loam, 0 to 3 percent slopes	600	0.1
151	Ridgeville fine sandy loam	295	0.1
165	Weir silt loam	1,620	0.3
180	Dupo silt loam	725	0.2
214B	Hosmer silt loam, 2 to 5 percent slopes	4,595	1.0
242A	Kendall silt loam, 0 to 3 percent slopes	555	0.1
243B	St. Charles silt loam, 2 to 5 percent slopes	370	0.1
248	McFain silty clay	2,615	0.5
278A	Stronghurst silt loam, 0 to 2 percent slopes	7,040	1.5
278B	Stronghurst silt loam, 2 to 5 percent slopes	9,705	2.0
279B	Rozetta silt loam, 2 to 5 percent slopes	25,935	5.5
279B3	Rozetta silty clay loam, 2 to 5 percent slopes, severely eroded	2,455	0.5
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded	6,140	1.3
279C3	Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded	14,205	3.1
279D3	Rozetta silty clay loam, 10 to 15 percent slopes, severely eroded	7,710	1.6
280B	Fayette silt loam, 2 to 5 percent slopes	11,415	2.4
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded	4,885	1.0
280D2	Fayette silt loam, 10 to 15 percent slopes, eroded	5,640	1.2
280E3	Fayette silty clay loam, 15 to 20 percent slopes, severely eroded	3,535	0.7
280F	Fayette silt loam, 15 to 30 percent slopes	13,555	2.9
284	Tice silt loam	3,220	0.7
302	Ambraw loam	635	0.1
304B	Landes very fine sandy loam, 1 to 5 percent slopes	3,000	0.6
331	Haymond silt loam	1,855	0.4
333	Wakeland silt loam	15,925	3.4
334	Birds silt loam	13,975	2.9
338	Hurst silty clay loam	210	*
386B	Downs silt loam, 2 to 5 percent slopes	4,110	0.9
386C2	Downs silt loam, 5 to 10 percent slopes, eroded	640	0.1
409	Aquents, clayey	1,155	0.2
415	Orion silt loam	8,040	1.7
430A	Raddle silt loam, 0 to 3 percent slopes	1,880	0.4
430B	Raddle silt loam, 3 to 6 percent slopes	640	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
451	Lawson silt loam	3,310	0.7
452A	Riley clay loam, 0 to 3 percent slopes	2,125	0.4
474	Piasa silt loam	3,020	0.6
517A	Marine silt loam, 0 to 2 percent slopes	11,925	2.5
517B	Marine silt loam, 2 to 5 percent slopes	14,190	3.0
533	Urban land	4,945	1.0
536	Dumps	640	0.1
581B2	Tamalco silt loam, 2 to 5 percent slopes, eroded	1,210	0.3
583B	Pike silt loam, 2 to 5 percent slopes	615	0.1
583C2	Pike silt loam, 5 to 10 percent slopes, eroded	1,375	0.3
583D2	Pike silt loam, 10 to 15 percent slopes, eroded	215	*
585E	Negley loam, 15 to 25 percent slopes	410	0.1
592A	Nameoki silty clay, 0 to 3 percent slopes	2,920	0.6
620B2	Darmstadt silt loam, 2 to 5 percent slopes, eroded	4,680	1.0
620C3	Darmstadt silty clay loam, 3 to 8 percent slopes, severely eroded	4,375	0.9
741B	Oakville fine sand, 2 to 5 percent slopes	420	0.1
741C	Oakville fine sand, 5 to 10 percent slopes	225	*
801B	Orthents, silty, undulating	860	0.2
801E	Orthents, silty, steep	1,140	0.2
802B	Orthents, loamy, undulating	3,000	0.6
802E	Orthents, loamy, steep	1,960	0.4
864	Pits, quarries	130	*
865	Pits, gravel	65	*
867	Oil-waste land	230	*
914C3	Atlas-Grantfork silty clay loams, 5 to 10 percent slopes, severely eroded	2,355	0.5
914D3	Atlas-Grantfork silty clay loams, 10 to 15 percent slopes, severely eroded	1,190	0.2
916B	Darmstadt-Oconee silt loams, 1 to 5 percent slopes	9,920	2.1
920	Rushville-Huey silt loams	3,320	0.7
936F	Fayette-Hickory complex, 15 to 30 percent slopes	8,925	1.9
941	Virden-Piasa silt loams	22,110	4.7
962E2	Sylvan-Bold silt loams, 15 to 20 percent slopes, eroded	1,920	0.4
962F	Sylvan-Bold silt loams, 20 to 30 percent slopes	4,215	0.9
967F	Hickory-Gosport silt loams, 15 to 30 percent slopes	600	0.1
993	Cowden-Piasa silt loams	15,855	3.4
995	Herrick-Piasa silt loams	14,015	2.9
1070	Beaucoup silty clay loam, wet	855	0.2
1071	Darwin silty clay, wet	1,020	0.2
2041B	Muscatine-Urban land complex, 1 to 4 percent slopes	490	0.1
2071	Darwin-Urban land complex	805	0.2
2113B	Oconee-Urban land complex, 1 to 4 percent slopes	440	0.1
2122B	Colp-Urban land complex, 1 to 5 percent slopes	340	0.1
2279B	Rozetta-Urban land complex, 2 to 8 percent slopes	8,085	1.7
2280D	Fayette-Urban land complex, 8 to 15 percent slopes	1,470	0.3
2284	Tice-Urban land complex	775	0.2
2304B	Landes-Urban land complex, 0 to 5 percent slopes	1,575	0.3
2452A	Riley-Urban land complex, 0 to 3 percent slopes	1,645	0.3
2592A	Nameoki-Urban land complex, 0 to 3 percent slopes	1,645	0.3
2741B	Oakville-Urban land complex, 1 to 6 percent slopes	1,460	0.3
3070	Beaucoup silty clay loam, frequently flooded	1,435	0.3
3071	Darwin silty clay, frequently flooded	1,090	0.2
3092B	Sarpy Variant loamy fine sand, frequently flooded, 0 to 6 percent slopes	1,445	0.3
3284	Tice silt loam, frequently flooded	3,265	0.7
3592A	Nameoki silty clay loam, frequently flooded, 0 to 3 percent slopes	1,885	0.4
6092B	Sarpy Variant loamy fine sand, 0 to 6 percent slopes	610	0.1
6304A	Landes Variant very fine sandy loam, 0 to 3 percent slopes	725	0.2
	Water	11,295	2.4
	Total	476,800	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name]

Map symbol	Soil name
37A	Worthen silt loam, 0 to 2 percent slopes
37B	Worthen silt loam, 2 to 5 percent slopes
41B	Muscatine silt loam, 1 to 4 percent slopes
46A	Herrick silt loam, 0 to 3 percent slopes
50	Virden silty clay loam (where drained)
61B	Atterberry silt loam, 1 to 4 percent slopes (where drained)
68	Sable silty clay loam (where drained)
70	Beaucoup silty clay loam (where drained)
71	Darwin silty clay (where drained)
78	Arenzville silt loam
102A	La Hogue loam, 0 to 3 percent slopes
113B	Oconee silt loam, 1 to 5 percent slopes (where drained)
122B	Colp silt loam, 1 to 4 percent slopes
127B	Harrison silt loam, 2 to 5 percent slopes
150A	Onarga sandy loam, 0 to 3 percent slopes
151	Ridgeville fine sandy loam
180	Dupo silt loam
214B	Hosmer silt loam, 2 to 5 percent slopes
242A	Kendall silt loam, 0 to 3 percent slopes (where drained)
243B	St. Charles silt loam, 2 to 5 percent slopes
248	McFain silty clay (where drained)
278A	Stronghurst silt loam, 0 to 2 percent slopes (where drained)
278B	Stronghurst silt loam, 2 to 5 percent slopes (where drained)
279B	Rozetta silt loam, 2 to 5 percent slopes
280B	Fayette silt loam, 2 to 5 percent slopes
284	Tice silt loam
302	Ambraw loam (where drained)
304B	Landes very fine sandy loam, 1 to 5 percent slopes
331	Haymond silt loam (where protected from flooding or not frequently flooded during the growing season)
333	Wakeland silt loam (where drained and either protected from flooding or not frequently flooded during the growing season)
334	Birds silt loam (where drained and either protected from flooding or not frequently flooded during the growing season)
386B	Downs silt loam, 2 to 5 percent slopes
415	Orion silt loam (where protected from flooding or not frequently flooded during the growing season)
430A	Raddle silt loam, 0 to 3 percent slopes
430B	Raddle silt loam, 3 to 6 percent slopes
451	Lawson silt loam (where protected from flooding or not frequently flooded during the growing season)
452A	Riley clay loam, 0 to 3 percent slopes
517A	Marine silt loam, 0 to 2 percent slopes (where drained)
517B	Marine silt loam, 2 to 5 percent slopes (where drained)
583B	Pike silt loam, 2 to 5 percent slopes
592A	Nameoki silty clay, 0 to 3 percent slopes
3284	Tice silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
6092B	Sarpy Variant loamy fine sand, 0 to 6 percent slopes (where irrigated)
6304A	Landes Variant very fine sandy loam, 0 to 3 percent slopes

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
7D3------------- Atlas	VIe	---	---	---	1.7	2.8
8E3------------- Hickory	VIe	---	---	---	2.3	3.9
8F-------------- Hickory	VIe	---	---	---	2.4	4.0
16-------------- Rushville	IIIw	93	33	53	4.2	7.0
19D3------------ Sylvan	IVe	76	27	50	3.6	5.9
35F------------- Bold	VIe	---	---	---	2.6	4.4
37A------------- Worthen	I	162	54	79	5.9	9.8
37B------------- Worthen	IIe	159	54	77	5.8	9.7
41B------------- Muscatine	IIe	177	59	80	6.1	10.2
46A------------- Herrick	IIw	159	45	61	5.5	9.2
50-------------- Virden	IIw	148	46	57	5.2	8.7
53B------------- Bloomfield	IIIs	64	31	41	3.2	5.3
61B------------- Atterberry	IIe	141	44	59	5.5	9.2
68-------------- Sable	IIw	167	51	61	5.6	9.3
70-------------- Beaucoup	IIw	138	46	55	5.1	8.5
71-------------- Darwin	IIIw	99	32	38	3.5	5.8
78-------------- Arenzville	IIw	123	42	63	5.4	9.0
102A------------ La Hogue	I	138	50	71	5.2	8.6
113B------------ Oconee	IIe	113	38	64	4.9	8.3

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
119C3----------- Elco	IVe	80	29	46	3.8	6.4
119D2----------- Elco	IIIe	83	30	47	4.0	6.6
119D3----------- Elco	IVe	76	29	44	3.7	6.1
120------------- Huey	IVw	52	21	37	2.6	4.3
122B------------ Colp	IIIe	70	29	49	3.6	6.0
122C3----------- Colp	IVe	53	22	37	2.7	4.5
127B------------ Harrison	IIe	144	49	74	5.2	8.4
127C2----------- Harrison	IIIe	136	46	70	5.0	8.0
150A------------ Onarga	IIs	118	42	61	4.2	7.0
151------------- Ridgeville	IIs	123	47	67	4.6	7.7
165------------- Weir	IIIw	84	34	51	3.9	6.5
180------------- Dupo	IIIw	132	43	55	5.2	8.7
214B------------ Hosmer	IIe	88	32	57	4.6	7.7
242A------------ Kendall	IIw	120	43	62	5.2	8.7
243B------------ St. Charles	IIe	110	40	62	5.0	8.3
248------------- McFain	IIw	118	49	61	4.2	7.0
278A------------ Stronghurst	IIw	113	39	62	5.3	8.8
278B------------ Stronghurst	IIe	112	39	61	5.2	8.7
279B------------ Rozetta	IIe	107	37	60	5.1	8.5
279B3----------- Rozetta	IIIe	84	32	49	3.0	6.3

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
279C2----------- Rozetta	IIIe	101	35	58	4.9	8.2
279C3----------- Rozetta	IVe	82	31	47	3.7	6.2
279D3----------- Rozetta	IVe	79	30	45	3.5	5.8
280B------------ Fayette	IIe	105	36	59	5.1	8.5
280C2----------- Fayette	IIIe	99	34	57	4.9	8.2
280D2----------- Fayette	IIIe	95	32	54	4.7	7.8
280E3----------- Fayette	VIe	---	---	---	4.0	6.7
280F------------ Fayette	VIe	---	---	---	4.2	7.0
284------------- Tice	I	153	47	61	5.7	9.5
302------------- Ambraw	IIw	132	43	52	4.6	7.7
304B------------ Landes	IIe	98	34	51	3.7	6.2
331------------- Haymond	IIw	115	41	---	5.3	8.8
333------------- Wakeland	IIw	111	41	---	5.2	8.7
334------------- Birds	IIIw	100	39	---	4.4	7.3
338------------- Hurst	IIIw	71	29	51	3.6	6.0
386B------------ Downs	IIe	140	45	70	5.5	9.2
386C2----------- Downs	IIIe	132	42	66	5.3	8.8
409**. Aquents						
415------------- Orion	IIw	111	40	59	4.7	7.8
430A------------ Raddle	I	160	53	75	5.8	9.7

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
430B------------ Raddle	IIe	150	50	70	5.4	9.6
451------------- Lawson	IIw	161	48	---	5.7	9.5
452A------------ Riley	IIs	122	41	55	4.8	8.0
474------------- Piasa	IIIw	73	29	44	3.1	5.2
517A------------ Marine	IIw	102	35	57	4.8	8.0
517B------------ Marine	IIe	101	34	57	4.8	7.9
533**. Urban land						
536**. Dumps						
581B2----------- Tamalco	IIIe	54	21	36	2.7	4.6
583B------------ Pike	IIe	94	34	60	5.0	8.3
583C2----------- Pike	IIIe	90	32	58	4.7	7.8
583D2----------- Pike	IIIe	85	30	55	4.5	7.5
585E------------ Negley	VIe	---	---	---	3.0	5.0
592A------------ Nameoki	IIw	128	46	64	4.5	7.5
620B2----------- Darmstadt	IIIe	55	24	38	2.8	4.7
620C3----------- Darmstadt	IVe	43	18	32	2.3	3.8
741B------------ Oakville	IVs	50	21	36	2.9	4.8
741C------------ Oakville	IVs	47	20	35	2.8	4.6
801B**, 801E**, 802B**, 802E**. Orthents						
864**, 865**. Pits						

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
867**. Oil-waste land						
914C3----------- Atlas-Grantfork	IVe	---	---	19	1.7	2.8
914D3----------- Atlas-Grantfork	VIe	---	---	---	1.6	2.7
916B------------ Darmstadt-Oconee	IIIe	87	28	48	3.8	6.3
920------------- Rushville-Huey	IVw	77	27	47	3.5	5.8
936F------------ Fayette-Hickory	VIe	---	---	---	3.5	5.8
941------------- Virden-Piasa	IIIw	118	44	61	4.3	7.2
962E2----------- Sylvan-Bold	VIe	---	---	---	3.6	6.0
962F------------ Sylvan-Bold	VIe	---	---	---	3.2	5.3
967F------------ Hickory-Gosport	VIIe	---	---	---	2.2	3.7
993------------- Cowden-Piasa	IIIw	106	37	59	4.1	6.8
995------------- Herrick-Piasa	IIIw	125	44	64	4.5	7.5
1070------------ Beaucoup	Vw	---	---	---	---	---
1071------------ Darwin	Vw	---	---	---	---	---
2041B. Muscatine-Urban land						
2071. Darwin-Urban land						
2113B. Oconee-Urban land						
2122B. Colp-Urban land						
2279B. Rozetta-Urban land						

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
2280D. Fayette-Urban land						
2284. Tice-Urban land						
2304B. Landes-Urban land						
2452A. Riley-Urban land						
2592A. Nameoki-Urban land						
2741B. Oakville-Urban land						
3070------------ Beaucoup	IVw	---	37	---	---	---
3071------------ Darwin	IVw	---	28	---	---	---
3092B----------- Sarpy Variant	IVw	---	22	---	---	---
3284------------ Tice	IIIw	---	47	---	5.0	8.3
3592A----------- Nameoki	IVw	---	23	---	---	---
6092B----------- Sarpy Variant	IIIs	85	28	40	3.3	5.5
6304A----------- Landes Variant	I	120	38	47	4.8	8.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
7D3 Atlas	4c	Slight	Slight	Moderate	Moderate	White oak	70	Green ash, pin oak, red maple, Austrian pine.
						Northern red oak	70	
						Bur oak	70	
						Green ash	---	
8E3, 8F Hickory	5r	Moderate	Moderate	Slight	Slight	White oak	85	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
						Northern red oak	85	
						Black oak	---	
						Green ash	---	
						Bitternut hickory	---	
						Yellow-poplar	95	
53B Bloomfield	4s	Slight	Slight	Moderate	Slight	Black oak	70	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.
						White oak	---	
						Scarlet oak	---	
						Shagbark hickory	---	
70 Beaucoup	5w	Slight	Severe	Moderate	Moderate	Pin oak	90	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood	100	
						Sweetgum	---	
						Cherrybark oak	---	
						American sycamore	---	
119D2, 119D3 Elco	4a	Slight	Slight	Slight	Slight	White oak	80	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
						Northern red oak	---	
						Black walnut	---	
279D3 Rozetta	5a	Slight	Slight	Slight	Slight	White oak	80	Eastern white pine, northern red oak, green ash, Scotch pine, yellow-poplar.
						Northern red oak	80	
						Yellow-poplar	90	
						Black walnut	---	
280C2, 280D2 Fayette	4a	Slight	Slight	Slight	Slight	White oak	80	Eastern white pine, northern red oak, green ash, yellow-poplar.
						Northern red oak	80	
						Yellow-poplar	90	
						Black walnut	---	
280E3, 280F Fayette	4r	Moderate	Moderate	Slight	Slight	White oak	80	Eastern white pine, northern red oak, green ash, yellow-poplar.
						Northern red oak	80	
						Yellow-poplar	90	
						Black walnut	---	
333 Wakeland	5a	Slight	Slight	Slight	Slight	Pin oak	90	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
						Sweetgum	88	
						Yellow-poplar	90	
						Virginia pine	85	
334 Birds	5w	Slight	Severe	Moderate	Moderate	Pin oak	90	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
						Eastern cottonwood	100	
						Sweetgum	---	
						Cherrybark oak	---	
						American sycamore	---	
415 Orion	2w	Slight	Moderate	Slight	Slight	Silver maple	80	White spruce, silver maple, white ash, eastern cottonwood.
						Red maple	---	
						White ash	---	

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
583D2: Pike	5a	Slight	Slight	Slight	Slight	White oak Yellow-poplar Sweetgum	90 98 76	Eastern white pine, red pine, black walnut, black locust, yellow-poplar, white ash.
585E: Negley	7r	Moderate	Moderate	Slight	Slight	Yellow-poplar Northern red oak White oak Black cherry Sugar maple White ash Black walnut	99 94 --- --- --- --- ---	Eastern white pine, yellow-poplar, red pine, white ash, white oak, northern red oak.
741B, 741C: Oakville	4s	Slight	Slight	Severe	Slight	White oak Red pine Eastern white pine Jack pine	70 78 85 68	Eastern white pine, red pine, jack pine.
936F*:								
Fayette	4r	Moderate	Moderate	Slight	Slight	White oak Northern red oak Yellow-poplar Black walnut	80 80 90 ---	Eastern white pine, northern red oak, green ash, yellow-poplar.
Hickory	5r	Moderate	Moderate	Slight	Slight	White oak Northern red oak Black oak Green ash Bitternut hickory Yellow-poplar	85 85 --- --- --- 95	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
962E2*, 962F*:								
Sylvan	6r	Moderate	Moderate	Moderate	Slight	Yellow-poplar White oak Northern red oak Black walnut	90 80 80 ---	White oak, black walnut, northern red oak, green ash, eastern white pine, red pine, sugar maple.
Bold.								
967F*:								
Hickory	5r	Moderate	Moderate	Slight	Slight	White oak Northern red oak Black oak Green ash Bitternut hickory Yellow-poplar	85 85 --- --- --- 95	Eastern white pine, red pine, yellow-poplar, sugar maple, white oak, black walnut.
Gosport	2r	Moderate	Moderate	Severe	Severe	White oak	45	Eastern white pine, red pine, Norway spruce, Scotch pine, white spruce, cottonwood.
1070: Beaucoup	5w	Slight	Severe	Moderate	Moderate	Pin oak Eastern cottonwood Sweetgum Cherrybark oak American sycamore	90 100 --- --- ---	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
1071---------------- Darwin	4w	Slight	Severe	Severe	Moderate	Pin oak------------- Swamp white oak----- Eastern cottonwood-- Green ash----------- American sycamore---	80 --- --- --- ---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.
3070---------------- Beaucoup	5w	Slight	Severe	Moderate	Moderate	Pin oak------------- Eastern cottonwood-- Sweetgum------------ Cherrybark oak------ American sycamore---	90 100 --- --- ---	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
3071---------------- Darwin	4w	Slight	Severe	Severe	Moderate	Pin oak------------- Swamp white oak----- Eastern cottonwood-- Green ash----------- American sycamore---	80 --- --- --- ---	Eastern cottonwood, American sycamore, red maple, green ash, pin oak.
3092B--------------- Sarpy Variant	7a	Slight	Slight	Slight	Slight	Yellow-poplar------- Eastern cottonwood-- American sycamore--- Sweetgum------------ Green ash-----------	95 105 --- --- ---	Sugar maple, eastern cottonwood, yellow-poplar, American sycamore, sweetgum, green ash, black walnut, eastern white pine.
3284---------------- Tice	5a	Slight	Slight	Slight	Slight	Pin oak------------- Sweetgum------------ Yellow-poplar------- Virginia pine------- Eastern cottonwood-- White ash-----------	96 86 90 90 --- ---	American sycamore, eastern cottonwood, green ash, yellow-poplar, red maple, cherrybark oak.
6092B--------------- Sarpy Variant	7a	Slight	Slight	Slight	Slight	Yellow-poplar------- Eastern cottonwood-- American sycamore--- Sweetgum------------ Green ash-----------	95 105 --- --- ---	Sugar maple, eastern cottonwood, yellow-poplar, American sycamore, sweetgum, green ash, black walnut, eastern white pine.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
7D3 Atlas	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
8E3, 8F Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
16 Rushville	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
19D3 Sylvan	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
35F Bold	Tatarian honeysuckle, Siberian peashrub.	Osageorange, jack pine, eastern redcedar, Washington hawthorn, Russian-olive.	Northern catalpa, honeylocust.	---	---
37A Worthen	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
37B. Worthen					
41B Muscatine	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
46A: Herrick	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
50: Virden	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
53B: Bloomfield	Siberian peashrub	Radiant crabapple, eastern redcedar, autumn-olive, Washington hawthorn, Amur honeysuckle, lilac, Tatarian honeysuckle.	Austrian pine, jack pine, red pine.	Eastern white pine	---
61B: Atterberry	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
68: Sable	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
70: Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
71: Darwin	---	Silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, blue spruce, Washington hawthorn, white fir.	Eastern white pine, Norway spruce.	Pin oak.
78: Arenzville	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Blue spruce, Austrian pine, Washington hawthorn, white fir, northern white-cedar.	Norway spruce	Pin oak, eastern white pine.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
102A. La Hogue	---	Silky dogwood, Amur honeysuckle, American cranberrybush, Amur privet.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
113B. Oconee	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
119C3, 119D2, 119D3. Elco	---	Silky dogwood, honeysuckle, Amur privet, American cranberrybush.	Northern white-cedar, Washington hawthorn, blue spruce, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
120. Huey	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
122B, 122C3. Colp	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
127B, 127C2. Harrison	---	American cranberrybush, Amur honeysuckle, autumn-olive, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
150A. Onarga	---	Amur privet, Washington hawthorn, American cranberrybush, Tatarian honeysuckle, Amur honeysuckle.	Austrian pine, northern white-cedar, osageorange, eastern redcedar.	Red pine, Norway spruce, eastern white pine.	---
151. Ridgeville	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
165. Weir	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
180. Dupo	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
214B. Hosmer	---	Eastern redcedar, arrowwood, Washington hawthorn, Tatarian honeysuckle, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
242A. Kendall					
243B. St. Charles	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
248. McFain	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
278A, 278B. Stronghurst	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
279B, 279B3, 279C2, 279C3, 279D3. Rozetta	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
280B, 280C2, 280D2, 280E3, 280F. Fayette	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
284 Tice	Redosier dogwood, gray dogwood.	Silky dogwood, autumn-olive.	Amur maple, Russian-olive, baldcypress.	Eastern white pine, Norway spruce.	Eastern cottonwood, American sycamore, red maple.
302 Ambraw	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
304B Landes	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
331 Haymond	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
333 Wakeland	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush, silky dogwood.	Northern white-cedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	---	Eastern white pine, pin oak.
334 Birds	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
338 Hurst	---	Washington hawthorn, Amur privet, arrowwood, Tatarian honeysuckle, Amur honeysuckle, eastern redcedar, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
386B, 386C2 Downs	---	American cranberrybush, Amur honeysuckle, autumn-olive, silky dogwood.	Blue spruce, northern white-cedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
409*. Aquents					
415 Orion	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
430A, 430B Raddle	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
451 Lawson	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
452A Riley	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
474 Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
517A, 517B Marine	---	Eastern redcedar, American cranberrybush, Amur privet, Washington hawthorn, Amur honeysuckle, autumn-olive, Tatarian honeysuckle.	Austrian pine, green ash, eastern white pine, osageorange.	Pin oak	---
533*. Urban land					
536*. Dumps					
581B2 Tamalco	Tatarian honeysuckle.	Russian-olive, eastern redcedar.	Siberian elm, green ash.	---	---
583B, 583C2, 583D2 Pike	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
585E: Negley	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
592A: Nameoki	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Austrian pine, white fir, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
620B2, 620C3: Darmstadt	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
741B, 741C: Oakville	Siberian peashrub	Eastern redcedar, lilac, radiant crabapple, autumn-olive, Washington hawthorn, Amur honeysuckle, Tatarian honeysuckle.	Red pine, Austrian pine, jack pine.	Eastern white pine	---
801B*, 801E*, 802B*, 802E*. Orthents					
864*, 865*. Pits					
867*. Oil-waste land					
914C3*, 914D3*:					
Atlas	---	American cranberrybush, Tatarian honeysuckle, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osageorange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
Grantfork	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Green ash, Siberian elm.	---	---
916B*:					
Darmstadt	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
916B*:					
Oconee	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
920*:					
Rushville	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Huey	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
936F*:					
Fayette	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
941*:					
Virden	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern white-cedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
962E2*, 962F*:					
Sylvan	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
962E2*, 962F*:					
Bold	Tatarian honeysuckle, Siberian peashrub.	Osageorange, jack pine, eastern redcedar, Washington hawthorn, Russian-olive.	Northern catalpa, honeylocust.	---	---
967F*:					
Hickory	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Gosport	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
993*:					
Cowden	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, blue spruce, Norway spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
995*:					
Herrick	---	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Piasa	Tatarian honeysuckle.	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
1070 Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
1071. Darwin					

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
2041B*:					
Muscatine	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.					
2071*:					
Darwin	---	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, Washington hawthorn, white fir.	Eastern white pine	Pin oak.
Urban land.					
2113B*:					
Oconee	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
Urban land.					
2122B*:					
Colp	---	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, Tatarian honeysuckle, American cranberrybush.	Austrian pine, green ash, osageorange.	Eastern white pine, pin oak.	---
Urban land.					
2279B*:					
Rozetta	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
2280D*:					
Fayette	---	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	White fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Urban land.					
2284*:					
Tice	Redosier dogwood, gray dogwood.	Silky dogwood, autumn-olive.	Amur maple, Russian-olive, baldcypress.	Eastern white pine, Norway spruce.	Eastern cottonwood, American sycamore, red maple.
Urban land.					
2304B*:					
Landes	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.					
2452A*:					
Riley	---	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern white-cedar, blue spruce, white fir, Austrian pine.	Norway spruce	Pin oak, eastern white pine.
Urban land.					
2592A*:					
Nameoki	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Austrian pine, white fir, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Urban land.					
2741B*:					
Oakville	Siberian peashrub	Eastern redcedar, lilac, radiant crabapple, autumn-olive, Washington hawthorn, Amur honeysuckle, Tatarian honeysuckle.	Red pine, Austrian pine, jack pine.	Eastern white pine	---
Urban land.					

See footnote at end of table.

TABLE 8.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
3070-------------- Beaucoup	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern white-cedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3071-------------- Darwin	---	Amur privet, silky dogwood, Amur honeysuckle, American cranberrybush.	Austrian pine, northern white-cedar, blue spruce, Washington hawthorn, white fir.	Eastern white pine, Norway spruce.	Pin oak.
3092B------------- Sarpy Variant	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3284-------------- Tice	---	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
3592A------------- Nameoki	---	American cranberrybush, Amur honeysuckle, Amur privet, silky dogwood.	Blue spruce, northern white-cedar, Austrian pine, white fir, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
6092B------------- Sarpy Variant	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.
6304A------------- Landes Variant	---	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern white-cedar, Washington hawthorn.	Norway spruce-----	Eastern white pine, pin oak.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
7D3 Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
8E3, 8F Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
16 Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
19D3 Sylvan	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
35F Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
37A Worthen	Slight	Slight	Slight	Slight	Slight.
37B Worthen	Slight	Slight	Moderate: slope.	Slight	Slight.
41B Muscatine	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
46A Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
50 Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53B Bloomfield	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
61B Atterberry	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
68 Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
70 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
71 Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
78 Arenzville	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
102A La Hogue	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
113B------------------ Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
119C3----------------- Elco	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Moderate: wetness.	Slight.
119D2, 119D3---------- Elco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
120------------------- Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
122B------------------ Colp	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Slight.
122C3----------------- Colp	Moderate: wetness.	Moderate: wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Slight.
127B------------------ Harrison	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
127C2----------------- Harrison	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
150A------------------ Onarga	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
151------------------- Ridgeville	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
165------------------- Weir	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
180------------------- Dupo	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding, percs slowly.	Moderate: wetness.	Moderate: wetness, flooding.
214B------------------ Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
242A------------------ Kendall	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
243B------------------ St. Charles	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
248------------------- McFain	Severe: flooding, ponding, too clayey.	Severe: ponding, too clayey.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
278A, 278B------------ Stronghurst	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
279B, 279B3 Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
279C2, 279C3 Rozetta	Slight	Slight	Severe: slope.	Slight	Slight.
279D3 Rozetta	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
280B Fayette	Slight	Slight	Moderate: slope.	Slight	Slight.
280C2 Fayette	Slight	Slight	Severe: slope.	Slight	Slight.
280D2 Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
280E3, 280F Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
284 Tice	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
302 Ambraw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
304B Landes	Severe: flooding.	Slight	Moderate: slope.	Slight	Moderate: droughty.
331 Haymond	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
333 Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: flooding, wetness.	Severe: flooding.
334 Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
338 Hurst	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
386B Downs	Slight	Slight	Moderate: slope.	Slight	Slight.
386C2 Downs	Slight	Slight	Severe: slope.	Slight	Slight.
409*. Aquents					
415 Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
430A Raddle	Severe: flooding.	Slight	Slight	Slight	Slight.
430B Raddle	Slight	Slight	Moderate: slope.	Slight	Slight.
451 Lawson	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
452A Riley	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
474 Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
517A, 517B Marine	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
533*. Urban land					
536*. Dumps					
581B2 Tamalco	Severe: percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: percs slowly, excess sodium.	Slight	Severe: excess sodium.
583B Pike	Slight	Slight	Moderate: slope.	Slight	Slight.
583C2 Pike	Slight	Slight	Severe: slope.	Slight	Slight.
583D2 Pike	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
585E Negley	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
592A Nameoki	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: too clayey.	Severe: too clayey.
620B2, 620C3 Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Severe: excess sodium.
741B Oakville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
741C Oakville	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
801B*, 801E*, 802B*, 802E*. Orthents					
864*, 865*. Pits					
867*. Oil-waste land					
914C3*:					
Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Grantfork	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
914D3*:					
Atlas	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: slope, wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Grantfork	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
916B*:					
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Severe: excess sodium.
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
920*:					
Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
936F*:					
Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
941*:					
Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
941*:					
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
962E2*:					
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
962F*:					
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
967F*:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Gosport	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
993*:					
Cowden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
995*:					
Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
1070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1071 Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2041B*:					
Muscatine	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
Urban land.					
2071*:					
Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
Urban land.					
2113B*:					
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2122B*:					
Colp	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Slight.
Urban land.					
2279B*:					
Rozetta	Slight	Slight	Moderate: slope.	Slight	Slight.
Urban land.					
2280D*:					
Fayette	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Urban land.					
2284*:					
Tice	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
2304B*:					
Landes	Severe: flooding.	Slight	Moderate: slope.	Slight	Moderate: droughty.
Urban land.					
2452A*:					
Riley	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2592A*:					
Nameoki	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: too clayey.	Severe: too clayey.
Urban land.					
2741B*:					
Oakville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Urban land.					
3070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3071 Darwin	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, flooding.	Severe: ponding, too clayey.	Severe: ponding, flooding, too clayey.
3092B Sarpy Variant	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
3284 Tice	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
3592A Nameoki	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: too clayey.	Severe: flooding, too clayey.
6092B Sarpy Variant	Severe: flooding.	Slight	Slight	Slight	Moderate: droughty.
6304A Landes Variant	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
7D3 Atlas	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8E3, 8F Hickory	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
16 Rushville	Poor	Fair	Poor	Fair	Good	Good	Poor	Fair	Good.
19D3 Sylvan	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
35F Bold	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
37A Worthen	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
37B Worthen	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
41B Muscatine	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
46A Herrick	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
50 Virden	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
53B Bloomfield	Poor	Fair	Fair	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
61B Atterberry	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
68 Sable	Fair	Good	Good	Fair	Good	Good	Good	Fair	Good.
70 Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
71 Darwin	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
78 Arenzville	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
102A La Hogue	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
113B Oconee	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
119C3, 119D2, 119D3 Elco	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
120. Huey	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
122B. Colp	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
122C3. Colp	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
127B. Harrison	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
127C2. Harrison	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
150A. Onarga	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
151. Ridgeville	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
165. Weir	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
180. Dupo	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
214B. Hosmer	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
242A. Kendall	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
243B. St. Charles	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
248. McFain	Good	Good	Good	Good	Good	Good	Good	Fair	Fair.
278A. Stronghurst	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
278B. Stronghurst	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
279B, 279B3. Rozetta	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
279C2, 279C3. Rozetta	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
279D3. Rozetta	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
280B. Fayette	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
280C2, 280D2. Fayette	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
280E3, 280F. Fayette	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
284 Tice	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
302 Ambraw	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
304B Landes	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
331 Haymond	Poor	Fair	Fair	Good	Poor	Poor	Fair	Good	Poor.
333 Wakeland	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
334 Birds	Good	Fair	Good	Good	Good	Good	Good	Good	Good.
338 Hurst	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
386B Downs	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
386C2 Downs	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
409*. Aquents									
415 Orion	Good	Good	Good	Good	Good	Fair	Good	Good	Good.
430A, 430B Raddle	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
451 Lawson	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
452A Riley	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
474 Piasa	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
517A Marine	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
517B Marine	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
533*. Urban land									
536*. Dumps									
581B2 Tamalco	Good	Good	Fair	Good	Poor	Poor	Good	Good	Poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
583B: Pike	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
583C2: Pike	Fair	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
583D2: Pike	Poor	Poor	Fair	Good	Very poor.	Very poor.	Poor	Good	Very poor.
585E: Negley	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
592A: Nameoki	Fair	Good	Fair	Good	Poor	Good	Fair	Good	Fair.
620B2: Darmstadt	Fair	Good	Poor	Good	Fair	Poor	Fair	Good	Poor.
620C3: Darmstadt	Fair	Good	Poor	Good	Poor	Very poor.	Fair	Good	Very poor.
741B: Oakville	Poor	Poor	Fair	Good	Poor	Very poor.	Poor	Good	Very poor.
741C: Oakville	Poor	Poor	Fair	Good	Very poor.	Very poor.	Poor	Good	Very poor.
801B*, 801E*, 802B*, 802E*. Orthents									
864*, 865*. Pits									
867*. Oil-waste land									
914C3*:									
Atlas	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Grantfork	Fair	Good	Fair	Good	Poor	Very poor.	Fair	Good	Very poor.
914D3*:									
Atlas	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Grantfork	Poor	Fair	Fair	Good	Very poor.	Very poor.	Fair	Good	Very poor.
916B*:									
Darmstadt	Fair	Good	Poor	Good	Fair	Poor	Fair	Good	Poor.
Oconee	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
920*:									
Rushville	Poor	Fair	Poor	Fair	Good	Good	Poor	Fair	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
920*:									
Huey	Poor	Poor	Poor	Fair	Good	Good	Poor	Fair	Good.
936F*:									
Fayette	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hickory	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
941*:									
Virden	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Piasa	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
962E2*:									
Sylvan	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bold	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
962F*:									
Sylvan	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Bold	Very poor.	Poor	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
967F*:									
Hickory	Poor	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Gosport	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
993*:									
Cowden	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Piasa	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
995*:									
Herrick	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Piasa	Poor	Fair	Fair	Poor	Good	Good	Poor	Poor	Good.
1070 Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
1071 Darwin	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
2041B*:									
Muscatine	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2071*:									
Darwin	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2071*: Urban land.									
2113B*: Oconee	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.									
2122B*: Colp	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.									
2279B*: Rozetta	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.									
2280D*: Fayette	Fair	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.									
2284*: Tice	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2304B*: Landes	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.									
2452A*: Riley	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Urban land.									
2592A*: Nameoki	Fair	Good	Fair	Good	Poor	Good	Fair	Good	Fair.
Urban land.									
2741B*: Oakville	Poor	Poor	Fair	Good	Poor	Very poor.	Poor	Good	Very poor.
Urban land.									
3070 Beaucoup	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
3071 Darwin	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements						Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
3092B--------------- Sarpy Variant	Poor	Fair	Fair	Good	Poor	Very poor.	Fair	Good	Very poor.
3284--------------- Tice	Poor	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair.
3592A--------------- Nameoki	Poor	Fair	Fair	Good	Poor	Good	Fair	Good	Fair.
6092B--------------- Sarpy Variant	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6304A--------------- Landes Variant	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
7D3: Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: low strength, wetness.	Severe: wetness.
8E3, 8F: Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
16: Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
19D3: Sylvan	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
35F: Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
37A: Worthen	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Severe: low strength, frost action.	Slight.
37B: Worthen	Slight	Slight	Slight	Slight	Severe: low strength, frost action.	Slight.
41B: Muscatine	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
46A: Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
50: Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
53B: Bloomfield	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
61B: Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
70 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding.	Severe: ponding.
71 Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
78 Arenzville	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
102A La Hogue	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
113B Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
119C3 Elco	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
119D2, 119D3 Elco	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
120 Huey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
122B, 122C3 Colp	Severe: wetness.	Severe: shrink-swell.	Severe: wetness.	Severe: shrink-swell.	Severe: low strength, frost action.	Slight.
127B Harrison	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
127C2 Harrison	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
150A Onarga	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
151 Ridgeville	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
165 Weir	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
180-----Dupo	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness, shrink-swell.	Severe: flooding.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.
214B-----Hosmer	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Severe: frost action.	Slight.
242A-----Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
243B-----St. Charles	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
248-----McFain	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, frost action.	Severe: ponding, too clayey.
278A, 278B-----Stronghurst	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
279B, 279B3-----Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
279C2, 279C3-----Rozetta	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
279D3-----Rozetta	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
280B-----Fayette	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: frost action, low strength.	Slight.
280C2-----Fayette	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: frost action, low strength.	Slight.
280D2-----Fayette	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
280E3, 280F-----Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
284-----Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
302-----Ambraw	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
304B-------------- Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: droughty.
331--------------- Haymond	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
333--------------- Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
334--------------- Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
338--------------- Hurst	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
386B-------------- Downs	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
386C2------------- Downs	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
409*. Aquents						
415--------------- Orion	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
430A-------------- Raddle	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: frost action.	Slight.
430B-------------- Raddle	Slight---------	Slight---------	Slight---------	Moderate: slope.	Severe: frost action.	Slight.
451--------------- Lawson	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
452A-------------- Riley	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
474--------------- Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
517A, 517B-------- Marine	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
533*. Urban land						
536*. Dumps						
581B2. Tamalco	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, frost action, shrink-swell.	Severe: excess sodium.
583B. Pike	Slight	Slight	Slight	Slight	Severe: low strength, frost action.	Slight.
583C2. Pike	Slight	Slight	Slight	Moderate: slope.	Severe: low strength, frost action.	Slight.
583D2. Pike	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
585E. Negley	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
592A. Nameoki	Severe: cutbanks cave, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, frost action.	Severe: too clayey.
620B2, 620C3. Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
741B. Oakville	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
741C. Oakville	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
801B*, 801E*, 802B*, 802E*. Orthents						
864*, 865*. Pits						
867*. Oil-waste land						
914C3*:						
Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
914D3*:						
Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: low strength, wetness.	Severe: wetness.
Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
916B*:						
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
920*:						
Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
Huey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
936F*:						
Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: frost action, low strength, slope.	Severe: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
941*:						
Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
962E2*, 962F*:						
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
967F*:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Gosport	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
993*:						
Cowden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: ponding.
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
995*:						
Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
1070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.
1071 Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, too clayey.
2041B*:						
Muscatine	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
Urban land.						
2071*:						
Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
Urban land.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2113B*:						
Oconee----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Urban land.						
2122B*:						
Colp------------	Severe: wetness.	Severe: shrink-swell.	Severe: wetness.	Severe: shrink-swell.	Severe: low strength, frost action.	Slight.
Urban land.						
2279B*:						
Rozetta----------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
Urban land.						
2280D*:						
Fayette----------	Moderate: slope.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: frost action, low strength.	Moderate: slope.
Urban land.						
2284*:						
Tice------------	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2304B*:						
Landes-----------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: droughty.
Urban land.						
2452A*:						
Riley------------	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, frost action.	Moderate: wetness.
Urban land.						
2592A*:						
Nameoki----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, frost action.	Severe: too clayey.
Urban land.						
2741B*:						
Oakville---------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2741B*: Urban land.						
3070-------------- Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3071-------------- Darwin	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding, too clayey.
3092B------------- Sarpy Variant	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3284-------------- Tice	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding, frost action.	Severe: flooding.
3592A------------- Nameoki	Severe: cutbanks cave, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, flooding, frost action.	Severe: flooding, too clayey.
6092B------------- Sarpy Variant	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Moderate: droughty.
6304A------------- Landes Variant	Moderate: too clayey, wetness.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: flooding, shrink-swell.	Severe: low strength, shrink-swell.	Slight.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7D3: Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
8E3, 8F: Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
16: Rushville	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
19D3: Sylvan	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
35F: Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
37A: Worthen	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Good.
37B: Worthen	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
41B: Muscatine	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
46A: Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
50: Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
53B: Bloomfield	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
61B: Atterberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
68: Sable	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
70: Beaucoup	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
71----------------- Darwin	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
78----------------- Arenzville	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
102A---------------- La Hogue	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
113B---------------- Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
119C3--------------- Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey.
119D2, 119D3-------- Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey.
120----------------- Huey	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
122B---------------- Colp	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
122C3--------------- Colp	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
127B---------------- Harrison	Severe: wetness.	Severe: wetness.	Moderate: wetness, too clayey.	Slight-----------	Fair: too clayey, wetness.
127C2--------------- Harrison	Severe: wetness.	Severe: slope, wetness.	Moderate: wetness, too clayey.	Slight-----------	Fair: too clayey, wetness.
150A---------------- Onarga	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: thin layer.
151----------------- Ridgeville	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness.	Poor: seepage, too sandy, wetness.
165----------------- Weir	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding.	Severe: ponding.	Poor: ponding.
180----------------- Dupo	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
214B---------------- Hosmer	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
242A---------------- Kendall	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
243B---------------- St. Charles	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
248----------------- McFain	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding.	Severe: ponding.	Poor: ponding.
278A, 278B---------- Stronghurst	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
279B, 279B3--------- Rozetta	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
279C2, 279C3-------- Rozetta	Moderate: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
279D3--------------- Rozetta	Moderate: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
280B---------------- Fayette	Slight-----------	Moderate: slope, seepage.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
280C2--------------- Fayette	Slight-----------	Severe: slope.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
280D2--------------- Fayette	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
280E3, 280F--------- Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
284----------------- Tice	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.
302----------------- Ambraw	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
304B---------------- Landes	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
331----------------- Haymond	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
333----------------- Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
334----------------- Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
338----------------- Hurst	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
386B---------------- Downs	Moderate: wetness.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
386C2--------------- Downs	Moderate: wetness.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
409*. Aquents					
415----------------- Orion	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
430A---------------- Raddle	Moderate: flooding.	Moderate: seepage.	Moderate: flooding.	Moderate: flooding.	Good.
430B---------------- Raddle	Slight-----------	Moderate: slope, seepage.	Slight-----------	Slight-----------	Good.
451----------------- Lawson	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
452A---------------- Riley	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy.
474----------------- Piasa	Severe: ponding, percs slowly.	Slight-----------	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
517A---------------- Marine	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
517B---------------- Marine	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
533*. Urban land					
536*. Dumps					

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
581B2 Tamalco	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, excess sodium.
583B Pike	Slight	Moderate: seepage, slope.	Severe: seepage.	Slight	Fair: too clayey.
583C2 Pike	Slight	Severe: slope.	Severe: seepage.	Slight	Fair: too clayey.
583D2 Pike	Moderate: slope.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.
585E Negley	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
592A Nameoki	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
620B2, 620C3 Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
741B Oakville	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
741C Oakville	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
801B*, 801E*, 802B*, 802E*. Orthents					
864*, 865*. Pits					
867*. Oil-waste land					
914C3*, 914D3*:					
Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Grantfork	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
916B*:					
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
916B*:					
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
920*:					
Rushville	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Huey	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
936F*:					
Fayette	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
941*:					
Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
962E2*, 962F*:					
Sylvan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Bold	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
967F*:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Gosport	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, hard to pack, slope.
993*:					
Cowden	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
995*:					
Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
1070 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
1071 Darwin	Severe: flooding, ponding, percs slowly.	Severe: flooding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
2041B*:					
Muscatine	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Urban land.					
2071*:					
Darwin	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Urban land.					
2113B*:					
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Urban land.					
2122B*:					
Colp	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Urban land.					
2279B*:					
Rozetta	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
Urban land.					

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2280D*:					
Fayette	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: slope, too clayey.
Urban land.					
2284*:					
Tice	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.
Urban land.					
2304B*:					
Landes	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
2452A*:					
Riley	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
2592A*:					
Nameoki	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
2741B*:					
Oakville	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
Urban land.					
3070 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3071 Darwin	Severe: flooding, ponding, percs slowly.	Severe: flooding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
3092B Sarpy Variant	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, too sandy.	Severe: flooding, seepage, wetness.	Fair: too sandy, wetness.
3284 Tice	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
3592A--------------- Nameoki	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
6092B--------------- Sarpy Variant	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Fair: too sandy, wetness.
6304A--------------- Landes Variant	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
7D3------------------- Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
8E3, 8F--------------- Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
16-------------------- Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
19D3------------------ Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
35F------------------- Bold	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
37A, 37B-------------- Worthen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
41B------------------- Muscatine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
46A------------------- Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
50-------------------- Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
53B------------------- Bloomfield	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: too sandy.
61B------------------- Atterberry	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
68-------------------- Sable	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
70-------------------- Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
71-------------------- Darwin	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
78-------------------- Arenzville	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
102A------------------ La Hogue	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
113B-----Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
119C3-----Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
119D2-----Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
119D3-----Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
120-----Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
122B, 122C3-----Colp	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
127B, 127C2-----Harrison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
150A-----Onarga	Good	Probable	Improbable: too sandy.	Fair: area reclaim, thin layer.
151-----Ridgeville	Fair: wetness.	Probable	Improbable: too sandy.	Good.
165-----Weir	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
180-----Dupo	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
214B-----Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
242A-----Kendall	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
243B-----St. Charles	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
248-----McFain	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
278A, 278B-----Stronghurst	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
279B-----Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
279B3----------------- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279C2----------------- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
279C3----------------- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
279D3----------------- Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
280B, 280C2----------- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
280D2----------------- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
280E3, 280F----------- Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
284------------------- Tice	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
302------------------- Ambraw	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
304B------------------ Landes	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: thin layer.
331------------------- Haymond	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
333------------------- Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
334------------------- Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
338------------------- Hurst	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
386B, 386C2----------- Downs	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
409*. Aquents				
415------------------- Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
430A, 430B------------ Raddle	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
451-------------------- Lawson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
452A------------------- Riley	Fair: wetness.	Probable-------------	Improbable: too sandy.	Fair: thin layer.
474-------------------- Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
517A, 517B------------ Marine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
533*. Urban land				
536*. Dumps				
581B2----------------- Tamalco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
583B, 583C2----------- Pike	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
583D2----------------- Pike	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
585E------------------ Negley	Fair: slope.	Probable-------------	Probable-------------	Poor: small stones, slope.
592A------------------ Nameoki	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
620B2, 620C3---------- Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
741B, 741C------------ Oakville	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
801B*, 801E*, 802B*, 802E*. Orthents				
864*, 865*. Pits				
867*. Oil-waste land				
914C3*:				
Atlas-----------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Grantfork-------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
914D3*:				
Atlas	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Grantfork	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
916B*:				
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
920*:				
Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
936F*:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
941*:				
Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
962E2*:				
Sylvan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bold	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
962F*:				
Sylvan	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bold	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
967F*:				
Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Gosport	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
993*:				
Cowden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
995*:				
Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
1070 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1071 Darwin	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
2041B*:				
Muscatine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2071*:				
Darwin	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Urban land.				
2113B*:				
Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
2122B*:				
Colp	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2279B*:				
Rozetta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2280D*:				
Fayette	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
Urban land.				
2284*:				
Tice	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
2304B*:				
Landes	Good	Probable	Improbable: too sandy.	Poor: thin layer.
Urban land.				
2452A*:				
Riley	Fair: wetness.	Probable	Improbable: too sandy.	Fair: thin layer.
Urban land.				
2592A*:				
Nameoki	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
2741B*:				
Oakville	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
3070 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3071 Darwin	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
3092B Sarpy Variant	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
3284 Tice	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
3592A: Nameoki	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
6092B: Sarpy Variant	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
6304A: Landes Variant	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
7D3 Atlas	Severe: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Slope, wetness.	Wetness, slope.
8E3, 8F Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
16 Rushville	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
19D3 Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
35F Bold	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
37A Worthen	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
37B Worthen	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
41B Muscatine	Moderate: seepage.	Moderate: wetness.	Frost action	Wetness	Wetness, erodes easily.	Erodes easily.
46A Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
50 Virden	Slight	Severe: hard to pack, ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
53B Bloomfield	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
61B Atterberry	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
68 Sable	Moderate: seepage.	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
70 Beaucoup	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
71 Darwin	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
78 Arenzville	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
102A La Hogue	Severe: seepage.	Severe: wetness, thin layer.	Frost action	Wetness	Wetness	Wetness.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
113B-------------- Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
119C3------------- Elco	Moderate: seepage, slope.	Moderate: piping, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Erodes easily.
119D2, 119D3------ Elco	Severe: slope.	Moderate: piping, wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
120--------------- Huey	Slight----------	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
122B-------------- Colp	Slight----------	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
122C3------------- Colp	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.
127B, 127C2------- Harrison	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope----------	Erodes easily	Erodes easily.
150A-------------- Onarga	Severe: seepage.	Severe: piping.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
151--------------- Ridgeville	Moderate: seepage.	Severe: seepage, piping, wetness.	Frost action, cutbanks cave.	Wetness, soil blowing.	Wetness, too sandy, soil blowing.	Wetness.
165--------------- Weir	Slight----------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
180--------------- Dupo	Moderate: seepage.	Severe: wetness.	Percs slowly, flooding, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
214B-------------- Hosmer	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
242A-------------- Kendall	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
243B-------------- St. Charles	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
248--------------- McFain	Slight----------	Severe: piping, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
278A-------------- Stronghurst	Moderate: seepage.	Severe: wetness.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
278B Stronghurst	Moderate: seepage, slope.	Severe: wetness.	Frost action, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
279B, 279B3, 279C2, 279C3 Rozetta	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
279D3 Rozetta	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
280B, 280C2 Fayette	Moderate: slope, seepage.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
280D2, 280E3, 280F Fayette	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
284 Tice	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Favorable.
302 Ambraw	Moderate: seepage.	Severe: wetness.	Ponding, frost action.	Ponding	Wetness	Wetness.
304B Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
331 Haymond	Moderate: seepage.	Severe: piping.	Deep to water	Flooding	Erodes easily	Erodes easily.
333 Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
334 Birds	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
338 Hurst	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
386B, 386C2 Downs	Moderate: seepage, slope.	Slight	Deep to water	Slope	Erodes easily	Erodes easily.
409*. Aquents						
415 Orion	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
430A Raddle	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
430B Raddle	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
451------------- Lawson	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
452A------------- Riley	Severe: seepage.	Severe: seepage, piping, wetness.	Frost action---	Wetness, rooting depth.	Wetness, too sandy.	Rooting depth.
474------------- Piasa	Slight---------	Severe: hard to pack, ponding, excess sodium.	Percs slowly, frost action, excess salt.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
517A------------- Marine	Slight---------	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
517B------------- Marine	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
533*. Urban land						
536*. Dumps						
581B2------------ Tamalco	Moderate: slope.	Severe: hard to pack, excess sodium.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Excess sodium, erodes easily.
583B, 583C2------- Pike	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
583D2------------ Pike	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
585E------------- Negley	Severe: seepage, slope.	Moderate: thin layer.	Deep to water	Slope----------	Slope----------	Slope.
592A------------- Nameoki	Moderate: seepage.	Severe: piping, wetness.	Percs slowly, frost action.	Wetness, slow intake, percs slowly.	Wetness--------	Wetness, percs slowly.
620B2------------ Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
620C3------------ Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, droughty, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
741B, 741C-------- Oakville	Severe: seepage.	Severe: piping, seepage.	Deep to water	Fast intake, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
801B*, 801E*, 802B*, 802E*. Orthents						

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
864*, 865*. Pits						
867*. Oil-waste land						
914C3*:						
Atlas	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Wetness	Wetness.
Grantfork	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Wetness, erodes easily.
914D3*:						
Atlas	Severe: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Slope, wetness.	Wetness, slope.
Grantfork	Severe: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, rooting depth.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
916B*:						
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess salt.
Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
920*:						
Rushville	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Huey	Slight	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
936F*:						
Fayette	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
941*:						
Virden	Slight	Severe: hard to pack, ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Percs slowly, frost action, excess salt.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
962E2*, 962F*:						
Sylvan	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Bold	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
967F*:						
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Gosport	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, depth to rock, rooting depth.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
993*:						
Cowden	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Percs slowly, frost action, excess salt.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
995*:						
Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Percs slowly, frost action, excess salt.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
1070 Beaucoup	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
1071 Darwin	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
2041B*:						
Muscatine	Moderate: seepage.	Moderate: wetness.	Frost action	Wetness	Wetness, erodes easily.	Erodes easily.
Urban land.						
2071*:						
Darwin	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
Urban land.						
2113B*:						
Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Urban land.						

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
2122B*:						
Colp	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.
Urban land.						
2279B*:						
Rozetta	Moderate: seepage, slope.	Slight	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Urban land.						
2280D*:						
Fayette	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Urban land.						
2284*:						
Tice	Moderate: seepage.	Severe: wetness.	Frost action	Wetness	Wetness	Favorable.
Urban land.						
2304B*:						
Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
Urban land.						
2452A*:						
Riley	Severe: seepage.	Severe: seepage, piping, wetness.	Frost action	Wetness, rooting depth.	Wetness, too sandy.	Rooting depth.
Urban land.						
2592A*:						
Nameoki	Moderate: seepage.	Severe: piping, wetness.	Percs slowly, frost action.	Wetness, slow intake, percs slowly.	Wetness	Wetness, percs slowly.
Urban land.						
2741B*:						
Oakville	Severe: seepage.	Severe: piping, seepage.	Deep to water	Fast intake, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
Urban land.						
3070 Beaucoup	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
3071-------------- Darwin	Slight---------	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
3092B------------- Sarpy Variant	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Erodes easily, soil blowing.	Erodes easily, droughty, rooting depth.
3284-------------- Tice	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness--------	Wetness--------	Favorable.
3592A------------- Nameoki	Moderate: seepage.	Severe: piping, wetness.	Percs slowly, flooding, frost action.	Wetness, slow intake, percs slowly.	Wetness--------	Wetness, percs slowly.
6092B------------- Sarpy Variant	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake, soil blowing.	Erodes easily, soil blowing.	Erodes easily, droughty, rooting depth.
6304A------------- Landes Variant	Moderate: seepage.	Moderate: hard to pack, wetness.	Deep to water	Soil blowing, percs slowly.	Soil blowing, percs slowly.	Rooting depth, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
7D3-------------- Atlas	0-6	Silty clay loam	CH, CL	A-7	0	100	100	95-100	75-95	45-65	30-40
	6-38	Silty clay, clay, clay loam.	CH	A-7	0	100	95-100	95-100	80-95	50-70	30-45
	38-60	Clay loam, loam	CH, CL	A-6, A-7	0-5	95-100	90-100	90-100	75-95	35-55	20-30
8E3-------------- Hickory	0-8	Clay loam--------	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	8-32	Clay loam, silty clay loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	32-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	80-95	80-95	60-80	20-40	5-20
8F--------------- Hickory	0-11	Silt loam--------	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	11-45	Clay loam, loam	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	45-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	80-95	80-95	60-80	20-40	5-20
16--------------- Rushville	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-20	Silt loam, silt	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-40	NP-15
	20-60	Silty clay loam, silty clay.	ML, CH, MH, CL	A-7	0	100	100	95-100	95-100	45-60	15-30
19D3------------- Sylvan	0-7	Silty clay loam	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	7-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	27-60	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
35F-------------- Bold	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
	5-60	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
37A, 37B--------- Worthen	0-20	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
	20-60	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	80-100	25-40	7-21
41B-------------- Muscatine	0-15	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	100	95-100	25-40	5-15
	15-49	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	20-30
	49-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
46A-------------- Herrick	0-18	Silt loam--------	CL, ML	A-4, A-6	0	100	100	95-100	90-100	30-40	5-15
	18-43	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-60	25-40
	43-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	80-95	30-40	10-20
50--------------- Virden	0-15	Silty clay loam	CL	A-7, A-6	0	100	100	98-100	95-100	30-45	10-20
	15-55	Silty clay, silty clay loam.	CH, CL, MH, ML	A-7	0	100	100	98-100	95-100	40-55	15-25
	55-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	98-100	90-100	30-45	10-20
53B-------------- Bloomfield	0-19	Loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	100	100	70-90	4-35	---	NP
	19-60	Fine sand, loamy fine sand, sand.	SP, SM, SP-SM	A-2-4, A-3	0	100	100	70-90	4-35	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
61B----------- Atterberry	0-15	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	25-40	5-15
	15-36	Silty clay loam, silt loam.	CL, CH	A-7, A-6	0	100	100	95-100	95-100	35-55	20-30
	36-60	Silt loam, loam	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
68------------ Sable	0-16	Silty clay loam	CL, CH, ML, MH	A-7	0	100	100	95-100	95-100	41-65	15-35
	16-47	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	95-100	40-55	20-35
	47-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	95-100	95-100	30-40	10-20
70------------ Beaucoup	0-12	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	12-45	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	45-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	90-100	60-95	20-40	5-20
71------------ Darwin	0-12	Silty clay--------	CH, CL	A-7	0	100	100	100	90-100	45-85	25-55
	12-60	Silty clay, clay	CH, CL	A-7	0	100	100	100	85-100	45-85	25-55
78------------ Arenzville	0-34	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	80-95	20-30	4-10
	34-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	85-95	30-45	10-20
102A---------- La Hogue	0-12	Loam------------	ML, CL, CL-ML	A-4	0	100	95-100	80-100	50-80	20-35	3-10
	12-32	Sandy clay loam, clay loam.	CL, SC	A-6, A-4	0	100	100	80-100	40-85	25-40	8-20
	32-40	Fine sandy loam, loamy sand, silt loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	100	90-100	75-90	15-70	15-30	2-15
	40-60	Stratified sand to silt loam.	CL, ML, SC, SM	A-4, A-2	0	90-100	80-100	50-95	10-60	<25	NP-10
113B---------- Oconee	0-8	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	8-16	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	20-35	8-20
	16-47	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	47-58	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-25
	58-60	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	85-100	20-35	8-20
119C3--------- Elco	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-45	15-30
	6-24	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	24-60	Silty clay loam, clay loam.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
119D2--------- Elco	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-28	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	28-60	Clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30
119D3--------- Elco	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-100	30-45	15-30
	6-24	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	95-100	85-100	25-45	11-30
	24-60	Clay loam, loam, clay.	CL	A-7, A-6	0	100	90-100	80-100	60-95	25-50	11-30

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
120------------- Huey	0-7	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	85-95	20-35	3-15
	7-9	Silt, silt loam	CL, ML, CL-ML	A-6, A-4	0	100	100	90-100	85-95	15-30	3-15
	9-19	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	25-45	10-25
	19-37	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	37-60	Loam, silt loam, silty clay loam.	CL	A-6	0	95-100	90-100	80-95	65-90	20-35	10-20
122B------------ Colp	0-12	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	12-43	Silty clay loam, silt loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	43-60	Stratified silt loam to silty clay loam.	CL, CH	A-6, A-7	0	100	100	95-100	85-100	35-55	15-30
122C3----------- Colp	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	6-42	Silty clay loam, silt loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	42-60	Stratified silty clay loam to silty loam.	CL, CH	A-6, A-7	0	100	100	95-100	85-100	35-55	15-30
127B, 127C2------ Harrison	0-10	Silt loam--------	CL	A-4, A-6	0	100	100	100	95-100	30-40	8-15
	10-41	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	30-45	10-20
	41-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0-5	95-100	85-100	80-85	70-80	30-50	10-25
150A------------ Onarga	0-16	Sandy loam-------	SC, SM, SM-SC	A-4, A-6, A-2	0	100	100	75-95	25-50	<28	NP-12
	16-31	Loam, sandy loam, fine sandy loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2-4, A-2-6	0	95-100	95-100	75-95	30-60	19-32	5-14
	31-60	Stratified fine sand to sandy loam.	SM, SP-SM, SM-SC	A-2, A-4	0	85-100	80-100	70-95	12-50	<20	NP-6
151------------- Ridgeville	0-10	Fine sandy loam	SC, SM, SM-SC	A-2, A-4, A-6	0	100	100	90-100	18-50	10-29	NP-12
	10-34	Fine sandy loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-4, A-6	0	95-100	95-100	75-95	36-60	20-34	5-14
	34-60	Loamy fine sand, sandy loam, fine sand.	SM, SM-SC, SC, SP-SM	A-2, A-4	0	90-100	90-100	70-98	12-50	<20	NP-8
165------------- Weir	0-22	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-17
	22-50	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	90-100	35-50	15-30
	50-60	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	20-30	9-16
180------------- Dupo	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	95-100	20-35	1-15
	8-27	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	20-35	5-15
	27-60	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0	100	100	100	98-100	35-55	15-30

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
214B------------- Hosmer	0-14	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<25	3-10
	14-30	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	30-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	70-95	20-30	5-15
242A------------- Kendall	0-17	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	20-35	5-15
	17-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
243B------------- St. Charles	0-12	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	22-35	7-15
	12-43	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	90-100	30-40	10-20
	43-60	Stratified silt loam to fine sandy loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0-5	90-100	80-90	60-90	30-70	15-35	5-15
248-------------- McFain	0-32	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	41-53	24-32
	32-38	Silt loam, loam, very fine sandy loam.	CL-ML, CL, SM-SC, SC	A-2, A-4, A-6	0	100	100	60-95	20-85	20-40	4-17
	38-60	Stratified loamy very fine sand to silty clay loam.	CL, SC	A-6	0	100	90-100	50-90	35-85	20-40	10-25
278A, 278B------- Stronghurst	0-18	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	25-35	5-15
	18-47	Silty clay loam	CL	A-7	0	100	100	100	98-100	41-50	19-28
	47-60	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	98-100	95-100	26-37	5-15
279B------------- Rozetta	0-13	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	13-58	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	58-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20
279B3------------ Rozetta	0-8	Silty clay loam	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-45	10-20
	8-24	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	24-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20
279C2------------ Rozetta	0-8	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	8-38	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	38-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20
279C3, 279D3----- Rozetta	0-7	Silty clay loam	ML, CL	A-6, A-7	0	100	100	95-100	95-100	35-45	10-20
	7-37	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
	37-60	Silt loam--------	CL	A-6	0	100	100	95-100	95-100	25-40	10-20
280B, 280C2, 280D2----------- Fayette	0-13	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	13-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
280E3------------ Fayette	0-8	Silty clay loam	ML, CL	A-7, A-6	0	100	100	100	95-100	35-45	10-20
	8-30	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
	30-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	10-20
280F------------- Fayette	0-9	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	9-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
284----------- Tice	0-8	Silt loam--------	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	8-41	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	41-60	Stratified silt loam to very fine sandy loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20
302----------- Ambraw	0-16	Loam-------------	CL	A-6	0	100	100	85-95	60-90	30-40	10-20
	16-34	Clay loam, sandy clay loam.	CL	A-7, A-6	0	100	100	85-95	50-85	30-50	10-25
	34-60	Stratified silty clay loam to sandy loam.	SC, ML, CL, SM	A-6, A-4	0	100	90-100	80-90	40-80	20-40	NP-17
304B---------- Landes	0-16	Very fine sandy loam.	SM, SC, SM-SC	A-4, A-2	0	100	70-100	70-95	20-50	<25	NP-10
	16-60	Stratified sand to silt loam.	SM, SP-SM, SC, SM-SC	A-2, A-4	0	100	85-100	70-95	10-50	<30	NP-10
331----------- Haymond	0-14	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	14-44	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	44-60	Very fine sandy loam, silt loam, loam.	ML, SM	A-4	0	95-100	90-100	80-100	35-90	27-36	4-10
333----------- Wakeland	0-8	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
	8-60	Silt loam--------	ML	A-4	0	100	100	90-100	80-90	27-36	4-10
334----------- Birds	0-8	Silt loam--------	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15
	8-60	Silt loam--------	CL	A-4, A-6	0	100	95-100	90-100	80-100	24-34	8-15
338----------- Hurst	0-6	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	6-39	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	39-60	Stratified silty clay loam to silty clay.	CL, CH	A-6, A-7	0	100	100	90-100	85-100	35-55	15-30
386B, 386C2------ Downs	0-17	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	17-42	Silty clay loam	CL	A-7, A-6	0	100	100	100	95-100	35-45	15-25
	42-60	Silt loam--------	CL	A-6	0	100	100	100	95-100	30-40	11-20
409*. Aquents											
415----------- Orion	0-7	Silt loam--------	CL, CL-ML	A-4	0	100	100	85-100	80-100	20-30	4-10
	7-35	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	100	100	90-100	70-80	20-30	4-10
	35-54	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	85-100	85-100	20-40	4-18
	54-60	Silt loam--------	CL, CL-ML	A-4	0	80-100	80-100	80-100	80-100	20-30	4-10
430A, 430B------- Raddle	0-16	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	85-100	25-35	8-15
	16-60	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	80-100	20-30	4-14
451----------- Lawson	0-30	Silt loam--------	CL, CL-ML	A-4	0	100	100	90-100	80-100	20-30	5-10
	30-60	Silty clay loam, silt loam.	CL	A-6	0	100	100	90-100	80-100	20-40	10-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
452A------------- Riley	0-11	Clay loam--------	CL	A-6	0	100	100	95-100	80-100	25-40	15-25
	11-20	Sandy clay loam, silty clay loam, silt loam.	CL, SC	A-6, A-7	0	100	100	90-100	40-85	35-50	15-25
	20-60	Loamy fine sand, sand, loamy sand.	SM, SM-SC, SP-SM	A-2, A-4	0	100	100	90-100	10-40	<25	NP-7
474------------- Piasa	0-9	Silt loam--------	CL, ML	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	9-17	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	17-53	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-55	15-25
	53-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
517A, 517B------- Marine	0-17	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-35	5-15
	17-52	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	95-100	40-60	20-35
	52-60	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	100	95-100	80-100	30-45	8-20
533*. Urban land											
536*. Dumps											
581B2------------ Tamalco	0-9	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	9-19	Silty clay loam, silty clay.	CH	A-7	0	100	100	95-100	95-100	55-75	35-45
	19-39	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	95-100	30-50	15-25
	39-60	Silt loam, loam, clay loam.	CL	A-6	0	100	100	95-100	80-100	30-40	15-25
583B, 583C2, 583D2----------- Pike	0-9	Silt loam--------	CL	A-4, A-6	0	100	100	90-100	80-95	25-35	8-15
	9-45	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	85-100	80-90	30-45	10-25
	45-60	Silty clay loam, silt loam, sandy clay loam.	CL, SC	A-6, A-2-6	0	80-90	70-90	60-90	30-80	20-35	10-20
585E------------- Negley	0-3	Loam-------------	ML, CL-ML, CL	A-4, A-6	0	85-100	75-100	70-90	55-85	25-40	4-15
	3-7	Loam, gravelly clay loam, gravelly sandy loam.	SM, ML	A-4, A-2, A-6, A-7	0-5	70-95	50-90	35-80	20-60	25-45	3-17
	7-60	Gravelly clay loam, sandy clay loam, clay loam.	SM-SC, SC	A-2, A-4, A-7, A-6	0-5	70-95	50-90	40-80	25-50	20-50	5-24
592A------------- Nameoki	0-11	Silty clay-------	CL, CH	A-7	0	100	100	100	90-100	45-65	20-40
	11-32	Silty clay, silty clay loam, clay.	CL, CH	A-7	0	100	100	95-100	85-100	45-65	20-40
	32-54	Silt loam, very fine sandy loam, silty clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	95-100	80-95	40-85	25-40	5-15
	54-60	Very fine sand, silt loam, silty clay loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	100	90-100	60-90	5-80	20-40	NP-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
620B2------------ Darmstadt	0-6	Silt loam--------	CL	A-6, A-7	0	95-100	95-100	95-100	75-100	25-45	10-20
	6-49	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	49-60	Silt loam, silty clay loam.	CL	A-6, A-7, A-4	0	95-100	95-100	90-100	75-100	20-50	7-30
620C3------------ Darmstadt	0-10	Silty clay loam	CL, CH	A-6, A-7	0	100	95-100	95-100	90-100	35-55	15-35
	10-29	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	29-60	Silt loam, silty clay loam.	CL	A-6, A-7, A-4	0	95-100	95-100	90-100	75-100	20-50	7-30
741B, 741C------- Oakville	0-11	Fine sand--------	SM, SP, SP-SM	A-2, A-3	0	100	100	50-85	0-35	---	NP
	11-60	Fine sand, sand, loamy fine sand.	SM, SP, SP-SM	A-2, A-3	0	100	95-100	65-95	0-25	---	NP
801B*, 801E*, 802B*, 802E*. Orthents											
864*, 865*. Pits											
867*. Oil-waste land											
914C3*, 914D3*:											
Atlas-----------	0-6	Silty clay loam	CH, CL	A-7	0	100	100	95-100	75-95	45-65	30-40
	6-38	Silty clay loam, clay, clay loam.	CH	A-7	0	100	95-100	95-100	80-95	50-70	30-45
	38-60	Clay loam, loam	CH, CL	A-6, A-7	0-5	95-100	90-100	90-100	75-95	35-55	20-30
Grantfork-------	0-5	Silty clay loam	CL	A-6	0	100	95-100	85-95	80-90	25-40	10-20
	5-37	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	100	90-100	80-90	70-80	30-45	10-20
	37-60	Clay loam, loam	CL	A-6, A-7	0-5	95-100	85-95	70-80	55-75	25-45	10-25
916B*:											
Darmstadt-------	0-9	Silt loam--------	CL	A-6, A-7	0	95-100	95-100	95-100	75-100	25-45	10-20
	9-49	Silty clay loam, silty clay.	CL, CH	A-7	0	100	95-100	95-100	90-100	40-65	20-40
	49-60	Silt loam, silty clay loam.	CL	A-6, A-7, A-4	0	95-100	95-100	90-100	75-100	20-50	7-30
Oconee----------	0-9	Silt loam--------	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	9-14	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	20-35	8-20
	14-47	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	47-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-25
920*:											
Rushville-------	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-19	Silt loam, silt	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	95-100	20-40	NP-15
	19-60	Silty clay loam, silty clay.	ML, CH, MH, CL	A-7	0	100	100	95-100	95-100	45-60	15-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
920*:											
Huey------------	0-9	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	85-95	20-35	3-15
	9-14	Silt, silt loam	CL, ML, CL-ML	A-6, A-4	0	100	100	90-100	85-95	15-30	3-15
	14-19	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	25-45	10-25
	19-44	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	15-30
	44-60	Loam, silt loam, silty clay loam.	CL	A-6	0	95-100	90-100	80-95	65-90	20-35	10-20
936F*:											
Fayette---------	0-10	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	10-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
Hickory---------	0-9	Loam-------------	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	9-45	Clay loam, loam	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	45-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	80-95	80-95	60-80	20-40	5-20
941*:											
Virden----------	0-14	Silt loam--------	CL	A-7, A-6	0	100	100	98-100	95-100	30-45	10-20
	14-58	Silty clay, silty clay loam.	CH, CL, MH, ML	A-7	0	100	100	98-100	95-100	40-55	15-25
	58-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	100	100	98-100	90-100	30-45	10-20
Piasa-----------	0-8	Silt loam--------	CL, ML	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	8-12	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	12-55	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-55	15-25
	55-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
962E2*, 962F*:											
Sylvan----------	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	8-23	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-50	20-30
	23-60	Silt loam--------	CL, CL-ML	A-6, A-4	0	100	100	95-100	95-100	20-40	5-20
Bold------------	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
	5-60	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	100	90-100	20-35	3-15
967F*:											
Hickory---------	0-11	Silt loam--------	CL	A-6, A-4	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	11-45	Clay loam, silt loam.	CL	A-6, A-7	0-5	95-100	90-100	80-95	65-80	30-50	15-30
	45-60	Clay loam, sandy loam, loam.	CL-ML, CL	A-4, A-6	0-5	85-100	80-95	80-95	60-80	20-40	5-20
Gosport---------	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-100	25-40	5-15
	5-32	Clay, silty clay	CH	A-7	0	100	100	95-100	85-100	50-65	35-50
	32-60	Weathered bedrock	CH	A-7	0	100	100	95-100	85-100	65-80	50-60
993*:											
Cowden----------	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-40	5-15
	8-17	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	17-60	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	95-100	45-60	20-32

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
993*:											
Piasa	0-9	Silt loam	CL, ML	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	9-17	Silt loam	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	17-53	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-55	15-25
	53-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
995*:											
Herrick	0-17	Silt loam	CL, ML	A-4, A-6	0	100	100	95-100	90-100	30-40	5-15
	17-50	Silty clay loam, silty clay.	CH, CL	A-7	0	100	100	95-100	90-100	45-60	25-40
	50-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	80-95	30-40	10-20
Piasa	0-8	Silt loam	CL, ML	A-6, A-7	0	100	100	95-100	90-100	30-45	10-20
	8-16	Silt loam	CL	A-4, A-6	0	100	100	95-100	90-100	25-40	8-20
	16-53	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	100	100	95-100	95-100	40-55	15-25
	53-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-45	10-25
1070 Beaucoup	0-11	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	11-45	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	45-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	90-100	60-95	20-40	5-20
1071 Darwin	0-8	Silty clay	CH, CL	A-7	0	100	100	100	90-100	45-85	25-55
	8-60	Silty clay, clay	CH, CL	A-7	0	100	100	100	85-100	45-85	25-55
2041B*:											
Muscatine	0-8	Silt loam	CL, CL-ML	A-6, A-4	0	100	100	100	95-100	25-40	5-15
	8-48	Silty clay loam	CL	A-7	0	100	100	100	95-100	40-50	20-30
	48-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
Urban land.											
2071*:											
Darwin	0-14	Silty clay	CH, CL	A-7	0	100	100	100	90-100	45-85	25-55
	14-60	Silty clay, clay	CH, CL	A-7	0	100	100	100	85-100	45-85	25-55
Urban land.											
2113B*:											
Oconee	0-8	Silt loam	CL	A-6	0	100	100	95-100	90-100	25-40	10-20
	8-21	Silt loam	CL	A-4, A-6	0	100	100	95-100	90-100	20-35	8-20
	21-47	Silty clay loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	47-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-50	10-25
Urban land.											
2122B*:											
Colp	0-15	Silt loam	CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	25-35	5-15
	15-43	Silty clay loam, silt loam, silty clay.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	20-35
	43-60	Stratified silty clay loam to silty clay.	CL, CH	A-6, A-7	0	100	100	95-100	85-100	35-55	15-30

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
2122B*:											
Urban land.											
2279B*:											
Rozetta----------	0-13	Silt loam--------	CL	A-4, A-6	0	100	100	95-100	95-100	24-35	8-15
	13-60	Silty clay loam	CL	A-7, A-6	0	100	100	95-100	95-100	35-50	15-30
Urban land.											
2280D*:											
Fayette----------	0-12	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	95-100	25-35	5-15
	12-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	100	95-100	35-45	15-25
Urban land.											
2284*:											
Tice-------------	0-11	Silt loam--------	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	11-56	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	56-60	Stratified silty clay loam to silt loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20
Urban land.											
2304B*:											
Landes-----------	0-15	Very fine sandy loam.	SM, SC, SM-SC	A-4, A-2	0	100	70-100	70-95	20-50	<25	NP-10
	15-60	Stratified loamy fine sand to very fine sandy loam.	SM, SP-SM, SC, SM-SC	A-2, A-4	0	100	85-100	70-95	10-50	<30	NP-10
Urban land.											
2452A*:											
Riley------------	0-9	Loam-------------	CL	A-6	0	100	100	90-100	80-100	30-40	10-20
	9-44	Clay loam, fine sandy loam, very fine sandy loam.	CL, SC, SM-SC, CL-ML	A-6, A-4	0	100	100	90-100	40-85	25-40	5-15
	44-60	Loamy fine sand, sand, loamy sand.	SM, SM-SC, SP-SM	A-2, A-4	0	100	100	90-100	10-40	<25	NP-7
Urban land.											
2592A*:											
Nameoki----------	0-15	Silty clay-------	CL, CH	A-7	0	100	100	100	90-100	45-65	20-40
	15-32	Silty clay, silty clay loam, clay.	CL, CH	A-7	0	100	100	95-100	85-100	45-65	20-40
	32-54	Silt loam, sandy loam, silty clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	95-100	80-95	40-85	25-40	5-15
	54-60	Very fine sand, silt loam, silty clay loam.	ML, CL, SM, SC	A-2, A-4, A-6	0	100	90-100	60-90	5-80	20-40	NP-15
Urban land.											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
2741B*:											
Oakville	0-11	Fine sand	SM, SP, SP-SM	A-2, A-3	0	100	100	50-85	0-35	---	NP
	11-60	Fine sand, sand, loamy fine sand.	SM, SP, SP-SM	A-2, A-3	0	100	95-100	65-95	0-25	---	NP
Urban land.											
3070 Beaucoup	0-14	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-25
	14-45	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	85-100	30-45	15-30
	45-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-4	0	100	100	90-100	60-95	20-40	5-20
3071 Darwin	0-10	Silty clay	CH, CL	A-7	0	100	100	100	90-100	45-85	25-55
	10-60	Silty clay, clay	CH, CL	A-7	0	100	100	100	85-100	45-85	25-55
3092B Sarpy Variant	0-7	Loamy fine sand	ML	A-4	0	100	100	95-100	75-85	20-30	NP-6
	7-38	Very fine sand, loamy very fine sand.	ML	A-4	0	100	100	95-100	75-85	20-25	NP-5
	38-60	Silt loam	CL	A-6	0	100	100	100	90-100	30-40	10-20
3284 Tice	0-16	Silt loam	CL	A-6, A-7	0	100	100	90-100	80-95	30-45	10-20
	16-41	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-55	15-30
	41-60	Stratified silty clay loam to loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	60-95	55-80	25-45	5-20
3592A Nameoki	0-14	Silty clay loam	CL, CH	A-7	0	100	100	100	90-100	45-65	20-40
	14-54	Silty clay, silty clay loam, clay.	CL, CH	A-7	0	100	100	95-100	85-100	45-65	20-40
	54-60	Silt loam, sandy loam, clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	100	95-100	80-95	40-85	25-40	5-15
6092B Sarpy Variant	0-7	Loamy fine sand	ML	A-4	0	100	100	95-100	75-85	20-30	NP-6
	7-38	Very fine sand, loamy very fine sand.	ML	A-4	0	100	100	95-100	75-85	20-25	NP-5
	38-60	Silt loam	CL	A-6	0	100	100	100	90-100	30-40	10-20
6304A Landes Variant	0-17	Very fine sandy loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	25-40	5-15
	17-27	Silty clay loam, loam, very fine sandy loam.	CL-ML, CL	A-4, A-6	0	100	100	95-100	85-95	25-40	5-15
	27-60	Silty clay loam, silty clay.	CL, CH	A-6, A-7	0	100	100	100	90-100	35-55	15-30

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
7D3-------------- Atlas	0-6	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High---------	0.32	2	7	.5-1
	6-38	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High---------	0.32			
	38-60	20-30	1.55-1.75	0.06-0.2	0.12-0.15	6.1-7.8	Moderate-----	0.32			
8E3-------------- Hickory	0-8	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
	8-32	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	32-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
8F--------------- Hickory	0-11	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
	11-45	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	45-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
16--------------- Rushville	0-8	15-27	1.25-1.45	0.2-0.6	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	8-20	10-22	1.30-1.50	0.06-0.2	0.15-0.20	4.5-6.5	Low----------	0.43			
	20-60	35-45	1.40-1.60	<0.2	0.11-0.20	4.5-7.8	High---------	0.43			
19D3------------- Sylvan	0-7	18-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-2
	7-27	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	27-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
35F-------------- Bold	0-5	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43	5	4L	1-2
	5-60	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43			
37A-------------- Worthen	0-20	15-22	1.20-1.40	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	3-4
	20-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	6.1-7.3	Low----------	0.43			
37B-------------- Worthen	0-18	15-22	1.20-1.40	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	3-4
	18-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	6.1-7.8	Low----------	0.43			
41B-------------- Muscatine	0-15	24-27	1.28-1.32	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	5-6
	15-49	30-35	1.28-1.35	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	49-60	22-30	1.35-1.40	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.43			
46A-------------- Herrick	0-18	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	3-4
	18-43	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High---------	0.43			
	43-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate-----	0.43			
50--------------- Virden	0-15	25-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	4	4-6
	15-55	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.3	High---------	0.28			
	55-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
53B-------------- Bloomfield	0-19	5-10	1.50-1.70	6.0-20	0.10-0.12	5.1-7.8	Low----------	0.15	5	2	.5-2
	19-60	2-10	1.60-1.80	6.0-20	0.06-0.11	5.1-7.3	Low----------	0.15			
61B-------------- Atterberry	0-15	20-26	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
	15-36	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	36-60	18-27	1.35-1.55	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
68--------------- Sable	0-16	27-35	1.15-1.35	0.6-2.0	0.21-0.23	5.6-7.3	Moderate-----	0.28	5	6	5-6
	16-47	24-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.28			
	47-60	20-28	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.28			
70--------------- Beaucoup	0-12	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate-----	0.32	5	7	5-6
	12-45	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	45-60	10-30	1.40-1.65	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.32			
71--------------- Darwin	0-12	35-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28	3	4	4-5
	12-60	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
78---------------Arenzville	0-34	10-18	1.20-1.55	0.6-2.0	0.20-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	34-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Moderate-----	0.37			
102A-------------La Hogue	0-12	10-27	1.40-1.60	0.6-2.0	0.20-0.24	6.1-7.8	Low----------	0.28	5	5	3-4
	12-32	18-35	1.50-1.70	0.6-2.0	0.12-0.20	5.1-7.3	Moderate-----	0.28			
	32-40	10-20	1.55-1.75	0.6-6.0	0.08-0.20	6.1-7.3	Low----------	0.20			
	40-60	5-20	1.60-1.80	2.0-6.0	0.05-0.22	5.6-7.8	Low----------	0.20			
113B-------------Oconee	0-8	20-27	1.20-1.30	0.2-0.6	0.22-0.24	5.6-7.8	Moderate-----	0.32	3	6	2-3
	8-16	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	16-47	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	47-58	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
	58-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
119C3------------Elco	0-6	25-33	1.20-1.35	0.6-2.0	0.18-0.21	5.6-7.3	Moderate-----	0.37	3	7	.5-1
	6-24	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	24-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
119D2------------Elco	0-8	20-27	1.20-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	4	6	1-3
	8-28	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	28-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
119D3------------Elco	0-6	25-33	1.20-1.35	0.6-2.0	0.18-0.21	5.6-7.3	Moderate-----	0.37	3	7	.5-1
	6-24	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.3	Moderate-----	0.37			
	24-60	25-45	1.40-1.60	0.2-0.6	0.14-0.20	5.1-7.3	Moderate-----	0.37			
120--------------Huey	0-7	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	2	6	1-3
	7-9	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low----------	0.43			
	9-19	20-35	1.40-1.60	0.06-0.2	0.10-0.18	5.6-8.4	Moderate-----	0.43			
	19-37	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	37-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
122B-------------Colp	0-12	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	3	6	1-2
	12-43	35-50	1.45-1.70	0.06-0.2	0.10-0.17	4.5-5.0	High---------	0.32			
	43-60	30-45	1.50-1.70	0.06-0.2	0.10-0.18	4.5-8.4	High---------	0.32			
122C3------------Colp	0-6	27-35	1.40-1.65	0.2-0.6	0.18-0.20	5.1-7.8	Moderate-----	0.43	2	7	.5-1
	6-42	35-50	1.45-1.70	0.06-0.2	0.10-0.17	4.5-5.0	High---------	0.32			
	42-60	30-45	1.50-1.70	0.06-0.2	0.10-0.18	4.5-8.4	High---------	0.32			
127B, 127C2------Harrison	0-10	20-27	1.15-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	2-4
	10-41	25-35	1.25-1.40	0.6-2.0	0.18-0.22	5.6-6.5	Moderate-----	0.43			
	41-60	20-35	1.30-1.45	0.6-2.0	0.14-0.20	5.6-7.3	Moderate-----	0.43			
150A-------------Onarga	0-16	8-15	1.15-1.45	0.6-6.0	0.13-0.16	5.6-7.8	Low----------	0.20	4	3	2-4
	16-31	15-18	1.45-1.70	0.6-6.0	0.15-0.19	4.5-7.3	Low----------	0.20			
	31-60	2-10	1.65-1.90	6.0-20	0.05-0.13	5.1-7.3	Low----------	0.15			
151--------------Ridgeville	0-10	10-15	1.15-1.45	0.6-2.0	0.15-0.22	5.6-6.5	Low----------	0.20	4	3	2-4
	10-34	14-18	1.45-1.70	0.6-2.0	0.15-0.19	5.6-6.5	Low----------	0.20			
	34-60	3-10	1.55-1.90	2.0-6.0	0.05-0.13	6.6-7.8	Low----------	0.20			
165--------------Weir	0-22	12-27	1.30-1.50	0.2-0.6	0.22-0.24	4.5-7.3	Low----------	0.43	4	6	1-3
	22-50	35-40	1.40-1.60	<0.06	0.18-0.20	4.5-5.5	High---------	0.43			
	50-60	20-27	1.45-1.65	0.06-0.2	0.20-0.22	4.5-6.5	Low----------	0.43			
180--------------Dupo	0-8	10-18	1.25-1.45	0.6-2.0	0.22-0.24	5.6-8.4	Low----------	0.37	5	5	1-2
	8-27	10-18	1.30-1.50	0.6-2.0	0.20-0.22	5.6-8.4	Low----------	0.37			
	27-60	35-45	1.35-1.60	0.06-0.2	0.08-0.19	5.1-7.8	High---------	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodi-bility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
214B------------- Hosmer	0-14	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
	14-30	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	30-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-7.3	Low----------	0.43			
242A------------- Kendall	0-17	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	17-60	27-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-7.3	Moderate-----	0.37			
243B------------- St. Charles	0-12	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5	6	1-3
	12-43	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37			
	43-60	10-25	1.55-1.75	0.6-2.0	0.11-0.22	5.6-7.8	Low----------	0.37			
248-------------- McFain	0-32	35-45	1.20-1.40	0.06-0.2	0.12-0.23	6.1-7.8	High---------	0.28	4	4	3-5
	32-38	10-20	1.45-1.65	0.06-0.2	0.12-0.22	6.6-8.4	Moderate-----	0.28			
	38-60	15-30	1.45-1.65	0.06-0.2	0.14-0.20	7.9-8.4	Moderate-----	0.28			
278A, 278B------- Stronghurst	0-18	20-27	1.25-1.45	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	18-47	27-35	1.30-1.55	0.2-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.37			
	47-60	20-27	1.35-1.60	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
279B------------- Rozetta	0-13	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	13-58	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	58-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
279B3------------ Rozetta	0-8	27-35	1.30-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Moderate-----	0.37	4	7	.5-1
	8-24	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	24-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
279C2------------ Rozetta	0-8	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	8-38	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	38-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
279C3, 279D3----- Rozetta	0-7	27-35	1.30-1.50	0.6-2.0	0.20-0.22	5.1-7.3	Moderate-----	0.37	4	7	.5-1
	7-37	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	37-60	20-27	1.40-1.60	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
280B, 280C2, 280D2----------- Fayette	0-13	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	13-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
280E3------------ Fayette	0-8	27-35	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Moderate-----	0.37	4	6	1-2
	8-30	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
	30-60	22-26	1.45-1.50	0.6-2.0	0.18-0.20	5.1-7.8	Moderate-----	0.37			
280F------------- Fayette	0-9	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	9-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
284-------------- Tice	0-8	22-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	7	2-3
	8-41	22-35	1.30-1.50	0.6-2.0	0.18-0.21	5.6-7.8	Moderate-----	0.32			
	41-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.6-7.8	Moderate-----	0.32			
302-------------- Ambraw	0-16	18-27	1.40-1.60	0.6-2.0	0.14-0.20	5.6-7.3	Moderate-----	0.28	5	5	2-3
	16-34	24-35	1.45-1.65	0.2-2.0	0.15-0.19	5.1-7.3	Moderate-----	0.28			
	34-60	18-30	1.50-1.70	0.2-2.0	0.11-0.22	6.1-8.4	Low----------	0.28			
304B------------- Landes	0-16	7-20	1.40-1.60	2.0-6.0	0.13-0.20	6.1-8.4	Low----------	0.20	5	3	1-2
	16-60	5-18	1.60-1.80	6.0-20	0.05-0.15	6.1-8.4	Low----------	0.20			
331-------------- Haymond	0-14	10-18	1.30-1.45	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	14-44	10-18	1.30-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			
	44-60	10-18	1.30-1.45	0.6-2.0	0.20-0.22	6.1-7.3	Low----------	0.37			
333-------------- Wakeland	0-8	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	8-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.37			

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
334------------- Birds	0-8	15-25	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.8	Low----------	0.43	5	6	1-3
	8-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low----------	0.43			
338------------- Hurst	0-6	27-35	1.40-1.65	0.2-0.6	0.18-0.22	4.5-7.3	Moderate-----	0.43	2	7	.5-1
	6-39	35-48	1.45-1.70	<0.06	0.10-0.17	3.6-7.3	High---------	0.32			
	39-60	30-45	1.50-1.70	<0.06	0.10-0.18	4.5-8.4	High---------	0.32			
386B, 386C2------ Downs	0-17	15-25	1.25-1.30	2.0-6.0	0.21-0.23	5.1-7.3	Low----------	0.32	5	6	2-3
	17-42	27-35	1.30-1.35	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.43			
	42-60	18-27	1.35-1.45	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.43			
409*. Aquents											
415------------- Orion	0-7	10-18	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	7-35	10-18	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
	35-54	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
	54-60	10-18	1.20-1.40	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
430A, 430B------- Raddle	0-16	18-24	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.32	5	6	2-4
	16-60	18-24	1.20-1.40	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
451------------- Lawson	0-30	10-20	1.20-1.55	0.6-2.0	0.22-0.24	6.1-7.8	Low----------	0.28	5	5	3-5
	30-60	18-30	1.55-1.65	0.6-2.0	0.18-0.20	6.1-7.8	Moderate-----	0.43			
452A------------ Riley	0-11	27-35	1.15-1.35	0.6-2.0	0.17-0.23	5.6-7.8	Moderate-----	0.28	4	6	3-4
	11-20	24-35	1.25-1.45	0.6-2.0	0.16-0.20	5.6-7.8	Moderate-----	0.28			
	20-60	2-10	1.65-1.80	6.0-20	0.05-0.10	6.6-8.4	Low----------	0.17			
474------------- Piasa	0-9	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	9-17	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	17-53	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	53-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
517A, 517B------- Marine	0-17	9-18	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	3	5	1-2
	17-52	35-48	1.45-1.70	0.06-0.2	0.11-0.18	4.5-6.5	High---------	0.37			
	52-60	15-35	1.45-1.65	0.2-0.6	0.18-0.22	5.1-6.5	Moderate-----	0.37			
533*. Urban land											
536*. Dumps											
581B2----------- Tamalco	0-9	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	2-3
	9-19	35-45	1.35-1.60	<0.06	0.09-0.14	4.5-7.8	High---------	0.43			
	19-39	20-35	1.50-1.70	<0.06	0.07-0.11	7.4-9.0	Moderate-----	0.43			
	39-60	20-30	1.55-1.75	<0.06	0.02-0.12	7.4-9.0	Moderate-----	0.43			
583B, 583C2, 583D2---------- Pike	0-9	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	5	.5-2
	9-45	22-35	1.30-1.45	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.37			
	45-60	18-35	1.30-1.45	0.6-2.0	0.12-0.18	4.5-6.5	Low----------	0.37			
585E------------ Negley	0-3	12-27	1.30-1.50	2.0-6.0	0.16-0.22	4.5-7.3	Low----------	0.32	3	5	1-3
	3-7	18-35	1.30-1.60	0.6-2.0	0.10-0.16	4.5-6.5	Low----------	0.32			
	7-60	22-38	1.20-1.60	0.6-2.0	0.06-0.14	4.5-6.0	Low----------	0.32			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
592A------------- Nameoki	0-11	35-60	1.20-1.40	<0.06	0.12-0.21	6.1-7.3	High---------	0.28	5	4	2-4
	11-32	35-60	1.30-1.50	<0.06	0.11-0.18	5.1-7.3	High---------	0.28			
	32-54	15-35	1.45-1.70	0.6-2.0	0.12-0.20	5.1-7.8	Low----------	0.28			
	54-60	5-30	1.50-1.80	0.6-2.0	0.05-0.20	5.6-7.8	Low----------	0.28			
620B2------------ Darmstadt	0-6	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	6-49	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate-----	0.43			
	49-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
620C3------------ Darmstadt	0-10	27-35	1.35-1.55	0.06-0.2	0.12-0.17	4.5-7.3	Moderate-----	0.43	2	7	.5-1
	10-29	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate-----	0.43			
	29-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
741B, 741C------- Oakville	0-11	0-10	1.30-1.55	6.0-20	0.07-0.09	5.6-7.3	Low----------	0.15	5	1	.5-1
	11-60	0-10	1.30-1.65	6.0-20	0.06-0.10	5.6-7.3	Low----------	0.15			
801B*, 801E*, 802B*, 802E*. Orthents											
864*, 865*. Pits											
867*. Oil-waste land											
914C3*, 914D3*:											
Atlas-----------	0-6	30-40	1.45-1.65	0.06-0.2	0.18-0.20	4.5-7.3	High---------	0.32	2	7	.5-2
	6-38	35-45	1.50-1.70	<0.06	0.09-0.13	4.5-7.3	High---------	0.32			
	38-60	20-30	1.55-1.75	0.06-0.2	0.12-0.15	6.1-7.8	Moderate-----	0.32			
Grantfork--------	0-5	20-30	1.35-1.55	0.2-0.6	0.15-0.20	4.5-7.8	Low----------	0.37	4	7	.5-1
	5-37	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	37-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
916B*:											
Darmstadt--------	0-9	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	9-49	27-35	1.40-1.65	<0.06	0.09-0.10	4.5-7.8	Moderate-----	0.43			
	49-60	15-25	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
Oconee-----------	0-9	20-27	1.20-1.30	0.2-0.6	0.22-0.24	5.6-7.8	Moderate-----	0.32	3-2	6	2-3
	9-14	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	14-47	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	47-60	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
920*:											
Rushville--------	0-8	15-27	1.25-1.45	0.2-0.6	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	8-19	10-22	1.30-1.50	0.06-0.2	0.15-0.20	4.5-6.5	Low----------	0.43			
	19-60	35-45	1.40-1.60	<0.2	0.11-0.20	4.5-7.8	High---------	0.43			
Huey-------------	0-9	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	2	6	1-3
	9-14	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low----------	0.43			
	14-19	20-35	1.40-1.60	0.06-0.2	0.10-0.18	5.6-8.4	Moderate-----	0.43			
	19-44	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	44-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
936F*:											
Fayette----------	0-10	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	10-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
936F*:											
Hickory----------	0-9	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
	9-45	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	45-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
941*:											
Virden-----------	0-14	25-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	4	4-6
	14-58	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.3	High---------	0.28			
	58-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
Piasa------------	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	8-12	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	12-55	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	55-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
962E2*, 962F*:											
Sylvan-----------	0-8	18-27	1.20-1.40	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-2
	8-23	25-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.37			
	23-60	18-27	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.37			
Bold-------------	0-5	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43	5	4L	.5-2
	5-60	12-18	1.10-1.30	0.6-2.0	0.20-0.24	7.4-8.4	Low----------	0.43			
967F*:											
Hickory----------	0-11	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.37	5	6	1-2
	11-45	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.37			
	45-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low----------	0.37			
Gosport----------	0-5	18-27	1.30-1.40	0.2-0.6	0.18-0.20	5.1-6.5	Low----------	0.43	3	6	1-2
	5-32	40-60	1.50-1.60	<0.06	0.12-0.14	3.6-5.5	High---------	0.32			
	32-60	40-75	1.70-1.90	<0.06	0.08-0.10	3.6-5.0	High---------	----			
993*:											
Cowden-----------	0-8	17-27	1.20-1.40	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	3	6	2-3
	8-17	17-27	1.25-1.45	0.2-0.6	0.18-0.20	4.5-7.3	Low----------	0.37			
	17-60	35-42	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
Piasa------------	0-9	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	9-17	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	17-53	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	53-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
995*:											
Herrick----------	0-17	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	3-4
	17-50	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High---------	0.43			
	50-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate-----	0.43			
Piasa------------	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	8-16	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	16-53	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	53-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
1070------------- Beaucoup	0-11	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate-----	0.32	5	7	5-6
	11-45	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	45-60	10-30	1.40-1.65	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.32			
1071------------- Darwin	0-8	35-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28	3	4	4-5
	8-60	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2041B*:											
Muscatine-------	0-8	24-27	1.28-1.32	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	5-6
	8-48	30-35	1.28-1.35	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.43			
	48-60	22-30	1.35-1.40	0.6-2.0	0.18-0.20	6.6-7.8	Moderate-----	0.43			
Urban land.											
2071*:											
Darwin----------	0-14	35-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28	3	4	4-5
	14-60	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28			
Urban land.											
2113B*:											
Oconee----------	0-8	20-27	1.20-1.30	0.2-0.6	0.22-0.24	5.6-7.8	Moderate-----	0.32	3	6	2-3
	8-21	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	21-47	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	47-60	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
Urban land.											
2122B*:											
Colp------------	0-15	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	3	6	1-2
	15-43	35-50	1.45-1.70	0.06-0.2	0.10-0.17	4.5-5.0	High---------	0.32			
	43-60	30-45	1.50-1.70	0.06-0.2	0.10-0.18	4.5-8.4	High---------	0.32			
Urban land.											
2279B*:											
Rozetta---------	0-13	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	13-60	27-35	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
Urban land.											
2280D*:											
Fayette---------	0-12	15-25	1.30-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
	12-60	25-35	1.30-1.45	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
Urban land.											
2284*:											
Tice------------	0-11	22-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	7	2-3
	11-56	22-35	1.30-1.50	0.6-2.0	0.18-0.21	5.6-7.8	Moderate-----	0.32			
	56-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.6-7.8	Moderate-----	0.32			
Urban land.											
2304B*:											
Landes----------	0-15	7-20	1.40-1.60	2.0-6.0	0.13-0.20	6.1-8.4	Low----------	0.20	5	3	1-2
	15-60	5-18	1.60-1.80	6.0-20	0.05-0.15	6.1-8.4	Low----------	0.20			
Urban land.											
2452A*:											
Riley-----------	0-9	24-27	1.20-1.40	0.6-2.0	0.18-0.24	5.6-7.8	Moderate-----	0.28	4	6	3-4
	9-44	15-35	1.25-1.45	0.6-2.0	0.16-0.20	5.6-7.8	Moderate-----	0.28			
	44-60	2-10	1.65-1.80	6.0-20	0.05-0.10	6.6-8.4	Low----------	0.17			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2452A*:											
Urban land.											
2592A*:											
Nameoki---------	0-15	35-60	1.20-1.40	<0.06	0.12-0.21	6.1-7.3	High---------	0.28	5	4	2-4
	15-32	35-60	1.30-1.50	<0.06	0.11-0.18	5.1-7.3	High---------	0.28			
	32-54	15-35	1.45-1.70	0.6-2.0	0.12-0.20	5.1-7.8	Low----------	0.28			
	54-60	5-30	1.50-1.80	0.6-2.0	0.05-0.20	5.6-7.8	Low----------	0.28			
Urban land.											
2741B*:											
Oakville--------	0-11	0-10	1.30-1.55	6.0-20	0.07-0.09	5.6-7.3	Low----------	0.15	5	1	.5-2
	11-60	0-10	1.30-1.65	6.0-20	0.06-0.10	5.6-7.3	Low----------	0.15			
Urban land.											
3070------------- Beaucoup	0-14	27-35	1.25-1.45	0.2-0.6	0.21-0.23	5.6-7.8	Moderate-----	0.32	5	7	5-6
	14-45	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	45-60	10-30	1.40-1.65	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.32			
3071------------- Darwin	0-10	35-45	1.20-1.40	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28	3	4	4-5
	10-60	45-60	1.30-1.50	<0.06	0.11-0.14	6.1-7.8	Very high----	0.28			
3092B------------ Sarpy Variant	0-7	5-10	1.55-1.75	6.0-20	0.10-0.12	6.6-7.8	Low----------	0.17	5	2	.5-1
	7-38	3-8	1.65-1.80	6.0-20	0.09-0.11	6.6-8.4	Low----------	0.17			
	38-60	20-25	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.43			
3284------------- Tice	0-16	22-35	1.25-1.45	0.6-2.0	0.21-0.24	6.1-7.8	Moderate-----	0.32	5	7	2-3
	16-41	22-35	1.30-1.50	0.6-2.0	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	41-60	15-30	1.40-1.60	0.6-2.0	0.11-0.18	5.6-7.8	Moderate-----	0.32			
3592A------------ Nameoki	0-14	35-60	1.20-1.40	<0.06	0.12-0.21	6.1-7.3	High---------	0.28	5	4	2-4
	14-54	35-60	1.30-1.50	<0.06	0.11-0.18	5.1-7.3	High---------	0.28			
	54-60	15-35	1.45-1.70	0.6-2.0	0.12-0.20	5.1-7.8	Low----------	0.28			
6092B------------ Sarpy Variant	0-7	5-10	1.55-1.75	6.0-20	0.10-0.12	6.6-7.8	Low----------	0.17	5	2	.5-1
	7-38	3-8	1.65-1.80	6.0-20	0.09-0.11	6.6-8.4	Low----------	0.17			
	38-60	20-25	1.30-1.50	0.6-2.0	0.20-0.22	6.6-8.4	Low----------	0.43			
6304A------------ Landes Variant	0-17	10-20	1.55-1.80	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.20	5	3	1-2
	17-27	12-18	1.55-1.80	0.6-2.0	0.16-0.19	6.1-7.8	Low----------	0.20			
	27-60	27-45	1.50-1.65	0.06-0.2	0.10-0.15	6.1-7.8	High---------	0.32			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
7D3----------- Atlas	D	None--------	---	---	0-2.0	Perched	Apr-Jun	>60	---	High-----	High-----	Moderate.
8E3, 8F--------- Hickory	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
16------------- Rushville	D	None--------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High-----	High-----	High.
19D3----------- Sylvan	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
35F------------ Bold	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Low.
37A------------ Worthen	B	None--------	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High-----	Moderate	Low.
37B------------ Worthen	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Low.
41B------------ Muscatine	B	None--------	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
46A------------ Herrick	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
50------------- Virden	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
53B------------ Bloomfield	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
61B------------ Atterberry	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
68------------- Sable	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
70------------- Beaucoup	B/D	Rare--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
71------------- Darwin	D	Rare--------	---	---	+1-2.0	Apparent	Mar-Jun	>60	---	Moderate	High-----	Low.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness		Uncoated steel	Concrete
					Ft			In				
78----------- Arenzville	B	Occasional	Brief-----	Mar-Jun	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
102A---------- La Hogue	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
113B---------- Oconee	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
119C3, 119D2, 119D3---------- Elco	B	None--------	---	---	2.5-4.5	Perched	Mar-May	>60	---	High-----	High-----	Moderate.
120----------- Huey	D	None--------	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High-----	High-----	Low.
122B, 122C3----- Colp	C	None--------	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High-----	High-----	High.
127B, 127C2----- Harrison	B	None--------	---	---	4.0-6.0	Perched	Mar-May	>60	---	High-----	High-----	Moderate.
150A---------- Onarga	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
151----------- Ridgeville	B	None--------	---	---	1.0-3.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
165----------- Weir	D	None--------	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High-----	High-----	High.
180----------- Dupo	C	Occasional	Brief-----	Mar-Jun	1.5-3.5	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
214B---------- Hosmer	C	None--------	---	---	2.5-3.0	Perched	Mar-Apr	>60	---	High-----	Moderate	High.
242A---------- Kendall	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
243B---------- St. Charles	B	None--------	---	---	3.0-6.0	Apparent	Mar-Jun	>60	---	High-----	Moderate	Moderate.
248----------- McFain	C	Rare--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
278A, 278B------ Stronghurst	B	None--------	---	---	1.0-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Moderate.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness		Uncoated steel	Concrete
					Ft			In				
279B, 279B3, 279C2, 279C3, 279D3----------- Rozetta	B	None---------	---	---	4.0-6.0	Apparent	Apr-Jun	>60	---	High-----	Moderate	Moderate.
280B, 280C2, 280D2, 280E3, 280F----------- Fayette	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
284------------- Tice	B	Rare---------	---	---	1.5-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
302------------- Ambraw	B/D	Rare---------	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
304B------------ Landes	B	Rare---------	---	---	>6.0	---	---	>60	---	Moderate	Low------	Low.
331------------- Haymond	B	Frequent----	Brief-----	Mar-May	>6.0	---	---	>60	---	High-----	Low------	Low.
333------------- Wakeland	C	Frequent----	Brief-----	Mar-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High-----	High-----	Low.
334------------- Birds	C/D	Frequent----	Long------	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
338------------- Hurst	D	Rare---------	---	---	1.0-3.0	Apparent	Mar-Apr	>60	---	Moderate	High-----	High.
386B, 386C2----- Downs	B	None---------	---	---	4.0-6.0	Apparent	Mar-Jun	>60	---	High-----	Moderate	Moderate.
409*. Aquents												
415------------- Orion	C	Frequent----	Brief-----	Mar-May	1.0-3.0	Apparent	Mar-May	>60	---	High-----	High-----	Low.
430A------------ Raddle	B	Rare---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
430B------------ Raddle	B	None---------	---	---	>6.0	---	---	>60	---	High-----	Moderate	Moderate.
451------------- Lawson	C	Frequent----	Brief-----	Mar-Jun	1.0-3.0	Apparent	Mar-May	>60	---	High-----	Moderate	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
452A------------ Riley	B	Rare--------	---	---	1.5-3.0	Apparent	Apr-Jun	>60	---	High-----	High-----	Low.
474------------- Piasa	D	None--------	---	---	+.5-2.0	Perched	Mar-May	>60	---	High-----	High-----	Low.
517A, 517B------ Marine	C	None--------	---	---	1.0-2.0	Perched	Jan-May	>60	---	High-----	High-----	High.
533*. Urban land												
536*. Dumps												
581B2----------- Tamalco	D	None--------	---	---	3.0-5.0	Apparent	Mar-Apr	>60	---	High-----	High-----	Low.
583B, 583C2, 583D2---------- Pike	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	High.
585E------------ Negley	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
592A------------ Nameoki	D	Rare--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
620B2, 620C3---- Darmstadt	D	None--------	---	---	1.0-3.0	Perched	Mar-May	>60	---	High-----	High-----	High.
741B, 741C------ Oakville	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	Moderate.
801B*, 801E*, 802B*, 802E*. Orthents												
864*, 865*. Pits												
867*. Oil-waste land												
914C3*, 914D3*: Atlas----------	D	None--------	---	---	0-2.0	Perched	Apr-Jun	>60	---	High-----	High-----	Moderate.
Grantfork------	D	None--------	---	---	1.0-3.0	Perched	Apr-May	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness		Uncoated steel	Concrete
					Ft			In				
916B*:												
Darmstadt-------	D	None---------	---	---	1.0-3.0	Perched	Mar-May	>60	---	High------	High------	High.
Oconee----------	C	None---------	---	---	1.0-3.0	Apparent	Mar-May	>60	---	High------	High------	High.
920*:												
Rushville-------	D	None---------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High------	High------	High.
Huey------------	D	None---------	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High------	High------	Low.
936F*:												
Fayette---------	B	None---------	---	---	>6.0	---	---	>60	---	High------	Moderate	Moderate.
Hickory---------	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
941*:												
Virden----------	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High------	High------	Moderate.
Piasa-----------	D	None---------	---	---	+.5-2.0	Perched	Mar-May	>60	---	High------	High------	Low.
962E2*, 962F*:												
Sylvan----------	B	None---------	---	---	>6.0	---	---	>60	---	High------	Moderate	Moderate.
Bold------------	B	None---------	---	---	>6.0	---	---	>60	---	High------	Low-------	Low.
967F*:												
Hickory---------	C	None---------	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Gosport---------	C	None---------	---	---	>6.0	---	---	20-40	Soft	Moderate	High------	High.
993*:												
Cowden----------	D	None---------	---	---	+.5-2.0	Apparent	Mar-May	>60	---	High------	High------	Moderate.
Piasa-----------	D	None---------	---	---	+.5-2.0	Perched	Mar-May	>60	---	High------	High------	Low.
995*:												
Herrick---------	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High------	High------	High.
Piasa-----------	D	None---------	---	---	+.5-2.0	Perched	Mar-May	>60	---	High------	High------	Low.
1070------------ Beaucoup	B/D	Occasional	Brief-----	Mar-Jun	+.5-2.0	Apparent	Nov-Jul	>60	---	High------	High------	Low.
1071------------ Darwin	D	Occasional	Long------	Jan-Jun	+1-2.0	Apparent	Nov-Jul	>60	---	Moderate	High------	Low.
2041B*:												
Muscatine-------	B	None---------	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High------	High------	Moderate.
Urban land.												

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness		Uncoated steel	Concrete
					Ft			In				
2071*:												
Darwin	D	Rare	---	---	+1-2.0	Apparent	Mar-Jun	>60	---	Moderate	High	Low.
Urban land.												
2113B*:												
Oconee	C	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	High.
Urban land.												
2122B*:												
Colp	C	None	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High	High	High.
Urban land.												
2279B*:												
Rozetta	B	None	---	---	4.0-6.0	Apparent	Apr-Jun	>60	---	High	Moderate	Moderate.
Urban land.												
2280D*:												
Fayette	B	None	---	---	>6.0	---	---	>60	---	High	Moderate	Moderate.
Urban land.												
2284*:												
Tice	B	Rare	---	---	1.5-3.0	Apparent	Mar-Jun	>60	---	High	High	Low.
Urban land.												
2304B*:												
Landes	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Low	Low.
Urban land.												
2452A*:												
Riley	B	Rare	---	---	1.5-3.0	Apparent	Apr-Jun	>60	---	High	High	Low.
Urban land.												
2592A*:												
Nameoki	D	Rare	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	High	Moderate.
Urban land.												
2741B*:												
Oakville	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Moderate.
Urban land.												

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness		Uncoated steel	Concrete
					Ft			In				
3070------------ Beaucoup	B/D	Frequent----	Long------	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
3071------------ Darwin	D	Frequent----	Long------	Mar-Jun	+1-2.0	Apparent	Mar-Jun	>60	---	Moderate	High-----	Low.
3092B----------- Sarpy Variant	B	Frequent----	Brief-----	Mar-Jun	3.0-5.0	Apparent	Mar-May	>60	---	Moderate	Low------	Low.
3284------------ Tice	B	Frequent----	Brief-----	Mar-Jun	1.5-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Low.
3592A----------- Nameoki	D	Frequent----	Brief-----	Mar-Jun	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	High-----	Moderate.
6092B----------- Sarpy Variant	B	Rare--------	---	---	3.0-5.0	Apparent	Mar-May	>60	---	Moderate	Low------	Low.
6304A----------- Landes Variant	C	Rare--------	---	---	3.0-5.0	Apparent	Mar-May	>60	---	Moderate	Moderate	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate that data were not available. MAX means maximum dry density; OPT, optimum moisture; LL, liquid limit; PI, plasticity index; UN, Unified; and NP, nonplastic]

Soil name and location	Report number 78ILL-119-	Horizon	Depth	Moisture density		Percentage passing sieve--				LL	PI	Classification	
				MAX	OPT	No. 4	No. 10	No. 40	No. 200			AASHTO	UN
			In	Lb/ft^3	Pct					Pct			
Elco silt loam:	70-3	Bt1	13-21	108	18	---	100	99	94	32	11	A-6(10)	CL
1,686 feet west and	70-5	2Bt3	28-43	105	18	---	100	98	90	45	27	A-7-6(25)	CL
965 feet north of	70-6, 7	2Bt4,	43-60	110	17	100	99	96	84	49	30	A-7-6(27)	CL
the southeast corner		2Bt5											
of sec. 27, T. 5 N.,													
R. 7 W.													
Huey silt loam:	65-1	Ap	0-9	101	18	---	100	99	96	26	3	A-4(1)	ML
1,780 feet south and	65-4	Btg2	19-32	106	19	---	100	97	95	44	25	A-7-6(25)	CL
280 feet east of the	65-7	2BCg	52-60	109	17	---	100	99	94	41	23	A-7-6(22)	CL
northwest corner of													
sec. 30, T. 5 N., R.													
5 W.													
Marine silt loam:	68-2, 3	E	3-13	106	17	---	100	96	93	24	5	A-4(3)	CL-ML
160 feet west and 60	68-5	Bt2	21-30	100	20	---	100	100	99	54	30	A-7-6(34)	CH
feet north of the	68-9	Btg2	50-60	108	19	---	100	100	99	36	15	A-6(16)	CL
southeast corner of													
sec. 10, T. 4 N., R.													
6 W.													
Oakville fine sand:	72-1	Ap	0-11	104	13	---	100	97	5	---	NP	A-3(0)	SP
160 feet east and	72-2	Bw1	11-23	103	13	---	100	98	5	---	NP	A-3(0)	SP
1,970 feet south of	72-4	C1	32-44	101	14	---	100	96	5	---	NP	A-3(0)	SP-SM
the northwest corner													
of sec. 18, T. 4 N.,													
R. 8 W.													
Pike silt loam:	69-1	Ap	0-9	109	16	---	100	100	97	26	8	A-4(5)	CL
595 feet north and	69-2	Bt1	9-16	103	21	---	100	100	97	43	20	A-7-6(22)	CL
660 feet east of the	69-4, 5	Bt3, Bt4	28-45	108	18	---	100	100	97	42	20	A-7-6(21)	CL
southwest corner of	69-7	2Bt6	56-60	112	15	100	99	98	89	35	15	A-6(13)	CL
sec. 31, T. 4 N., R.													
5 W.													
Tamalco silt loam:	66-1	Ap	0-9	104	18	---	100	97	95	29	8	A-4(7)	CL
1,140 feet east and	66-2, 3	Bt1, Bt2	9-19	96	22	---	100	100	99	59	37	A-7-6(42)	CH
330 feet south of	66-4	Bt3	19-28	100	17	---	100	100	99	55	35	A-7-6(38)	CH
the center of sec.	66-6	C	39-53	112	16	100	99	99	96	34	14	A-6(13)	CL
17, T. 5 N., R. 5 W.													

TABLE 19.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ambraw	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Aquents, clayey	Fine, montmorillonitic, mesic Aquents
Arenzville	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
Atterberry	Fine-silty, mixed, mesic Udollic Ochraqualfs
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Bloomfield	Sandy, mixed, mesic Psammentic Hapludalfs
Bold	Coarse-silty, mixed (calcareous), mesic Typic Udorthents
Colp	Fine, montmorillonitic, mesic Aquic Hapludalfs
*Cowden	Fine, montmorillonitic, mesic Mollic Albaqualfs
Darmstadt	Fine-silty, mixed, mesic Albic Natraqualfs
Darwin	Fine, montmorillonitic, mesic Vertic Haplaquolls
Downs	Fine-silty, mixed, mesic Mollic Hapludalfs
Dupo	Coarse-silty over clayey, mixed, nonacid, mesic Aquic Udifluvents
Elco	Fine-silty, mixed, mesic Typic Hapludalfs
Fayette	Fine-silty, mixed, mesic Typic Hapludalfs
*Gosport	Fine, illitic, mesic Typic Dystrochrepts
Grantfork	Fine-loamy, mixed, mesic, sloping Aeric Ochraqualfs
Harrison	Fine-silty, mixed, mesic Typic Argiudolls
Haymond	Coarse-silty, mixed, nonacid, mesic Typic Udifluvents
Herrick	Fine, montmorillonitic, mesic Aquic Argiudolls
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs
*Huey	Fine-silty, mixed, mesic Typic Natraqualfs
Hurst	Fine, montmorillonitic, mesic Aeric Ochraqualfs
*Kendall	Fine-silty, mixed, mesic Aeric Ochraqualfs
La Hogue	Fine-loamy, mixed, mesic Aquic Argiudolls
*Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Landes Variant	Coarse-silty over clayey, mixed, mesic Fluventic Hapludolls
Lawson	Fine-silty, mixed, mesic Cumulic Hapludolls
Marine	Fine, montmorillonitic, mesic Aeric Albaqualfs
*McFain	Clayey over loamy, montmorillonitic, mesic Fluvaquentic Haplaquolls
*Muscatine	Fine-silty, mixed, mesic Aquic Hapludolls
Nameoki	Fine, montmorillonitic, mesic Vertic Hapludolls
Negley	Fine-loamy, mixed, mesic Typic Paleudalfs
Oakville	Mixed, mesic Typic Udipsamments
Oconee	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Onarga	Coarse-loamy, mixed, mesic Typic Argiudolls
*Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Orthents, loamy	Loamy, mixed, mesic Udorthents
Orthents, silty	Fine-silty, mixed, mesic Udorthents
Piasa	Fine, montmorillonitic, mesic Mollic Natraqualfs
*Pike	Fine-silty, mixed, mesic Ultic Hapludalfs
Raddle	Fine-silty, mixed, mesic Typic Hapludolls
Ridgeville	Coarse-loamy, mixed, mesic Aquic Argiudolls
Riley	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Fluvaquentic Hapludolls
Rozetta	Fine-silty, mixed, mesic Typic Hapludalfs
Rushville	Fine, montmorillonitic, mesic Typic Albaqualfs
Sable	Fine-silty, mixed, mesic Typic Haplaquolls
Sarpy Variant	Coarse-loamy, mixed, nonacid, mesic Typic Udifluvents
St. Charles	Fine-silty, mixed, mesic Typic Hapludalfs
Stronghurst	Fine-silty, mixed, mesic Aeric Ochraqualfs
Sylvan	Fine-silty, mixed, mesic Typic Hapludalfs
Tamalco	Fine, montmorillonitic, mesic Typic Natrudalfs
Tice	Fine-silty, mixed, mesic Fluvaquentic Hapludolls
Virden	Fine, montmorillonitic, mesic Typic Argiaquolls
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Weir	Fine, montmorillonitic, mesic Typic Ochraqualfs
Worthen	Fine-silty, mixed, mesic Cumulic Hapludolls

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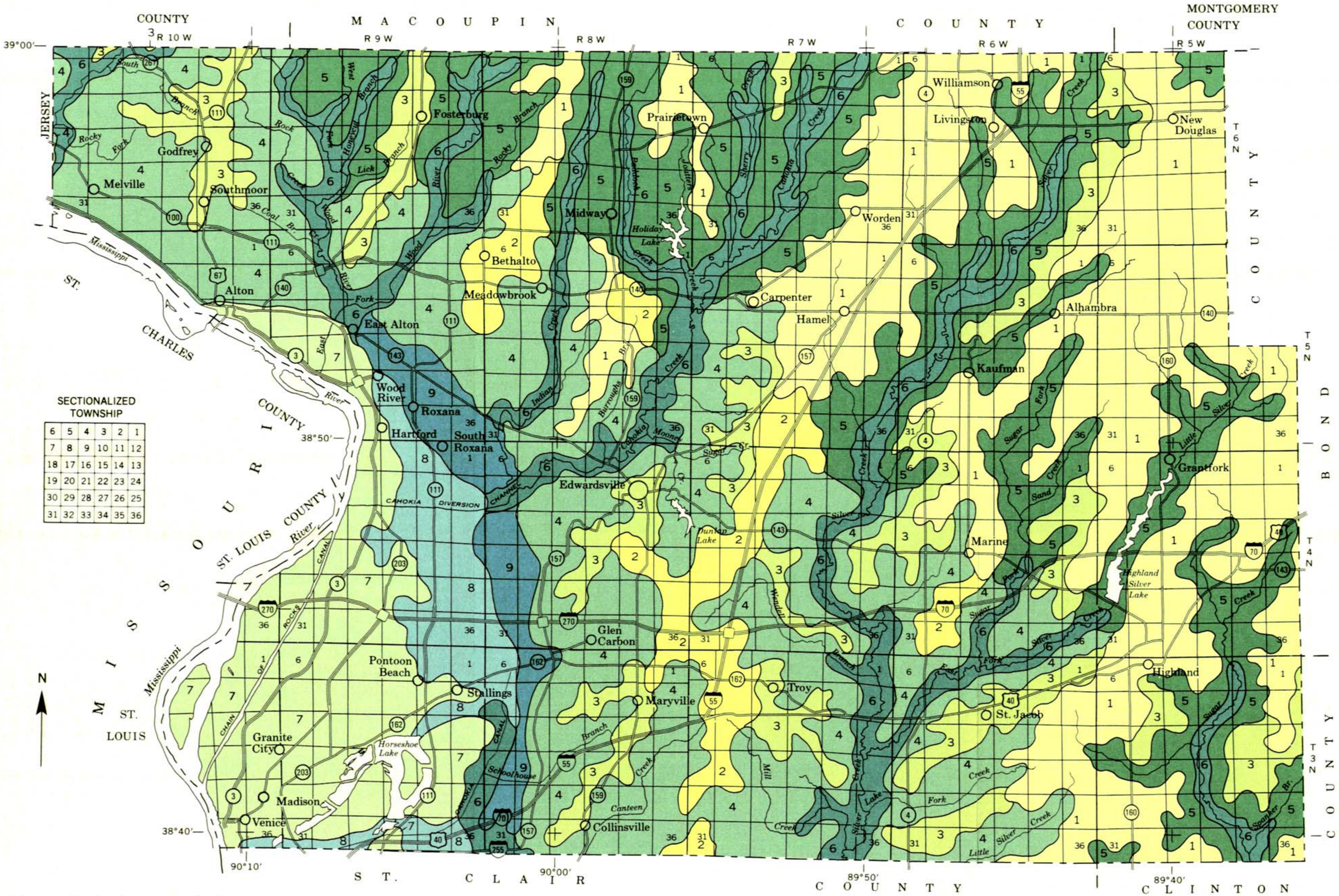
NRCS Accessibility Statement



LEGEND

NEARLY LEVEL TO MODERATELY SLOPING, MODERATELY WELL DRAINED TO POORLY DRAINED SOILS ON UPLANDS

1 Virden-Piasa-Darmstadt association: Nearly level to moderately sloping, poorly drained and somewhat poorly drained soils that have a moderately slowly permeable or very slowly permeable subsoil; formed in loess on uplands

2 Muscatine-Atterberry-Downs association: Gently sloping and moderately sloping, somewhat poorly drained and moderately well drained soils that have a moderately permeable subsoil; formed in loess on uplands

3 Marine-Rozetta-Stronghurst association: Nearly level and gently sloping, somewhat poorly drained and moderately well drained soils that have a slowly permeable or moderately permeable subsoil; formed in loess on uplands

GENTLY SLOPING TO STEEP, WELL DRAINED AND MODERATELY WELL DRAINED SOILS ON UPLANDS

4 Fayette-Rozetta association: Gently sloping to steep, well drained and moderately well drained soils that have a moderately permeable subsoil; formed in loess on uplands

5 Hickory-Elco-Rozetta association: Moderately sloping to steep, well drained and moderately well drained soils that have a moderately permeable or moderately slowly permeable subsoil; formed in glacial till, loess, and loess over an older buried soil; on uplands

NEARLY LEVEL TO MODERATELY SLOPING, WELL DRAINED TO VERY POORLY DRAINED SOILS ON FLOOD PLAINS, TERRACES, AND FOOT SLOPES

6 Wakeland-Birds-Orion association: Nearly level, somewhat poorly drained and poorly drained soils that are moderately permeable or moderately slowly permeable; formed in silty alluvial sediment on flood plains

7 Tice-Nameoki-Landes association: Nearly level and gently sloping, somewhat poorly drained and well drained soils that are moderately permeable throughout, very slowly permeable in the upper part and moderately permeable in the lower part, or moderately rapidly permeable in the upper part and rapidly permeable in the lower part; formed in silty, clayey, loamy, and sandy alluvial sediment; on flood plains, natural levees, and low terraces

8 Darwin association: Nearly level, poorly drained and very poorly drained soils that have a very slowly permeable subsoil; formed in clayey alluvial sediment on flood plains

9 Raddle-Haymond-Oakville association: Nearly level to moderately sloping, well drained soils that have a moderately permeable or rapidly permeable subsoil; formed in silty and sandy alluvial sediment on foot slopes, flood plains, and terraces

COMPILED 1984

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ILLINOIS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

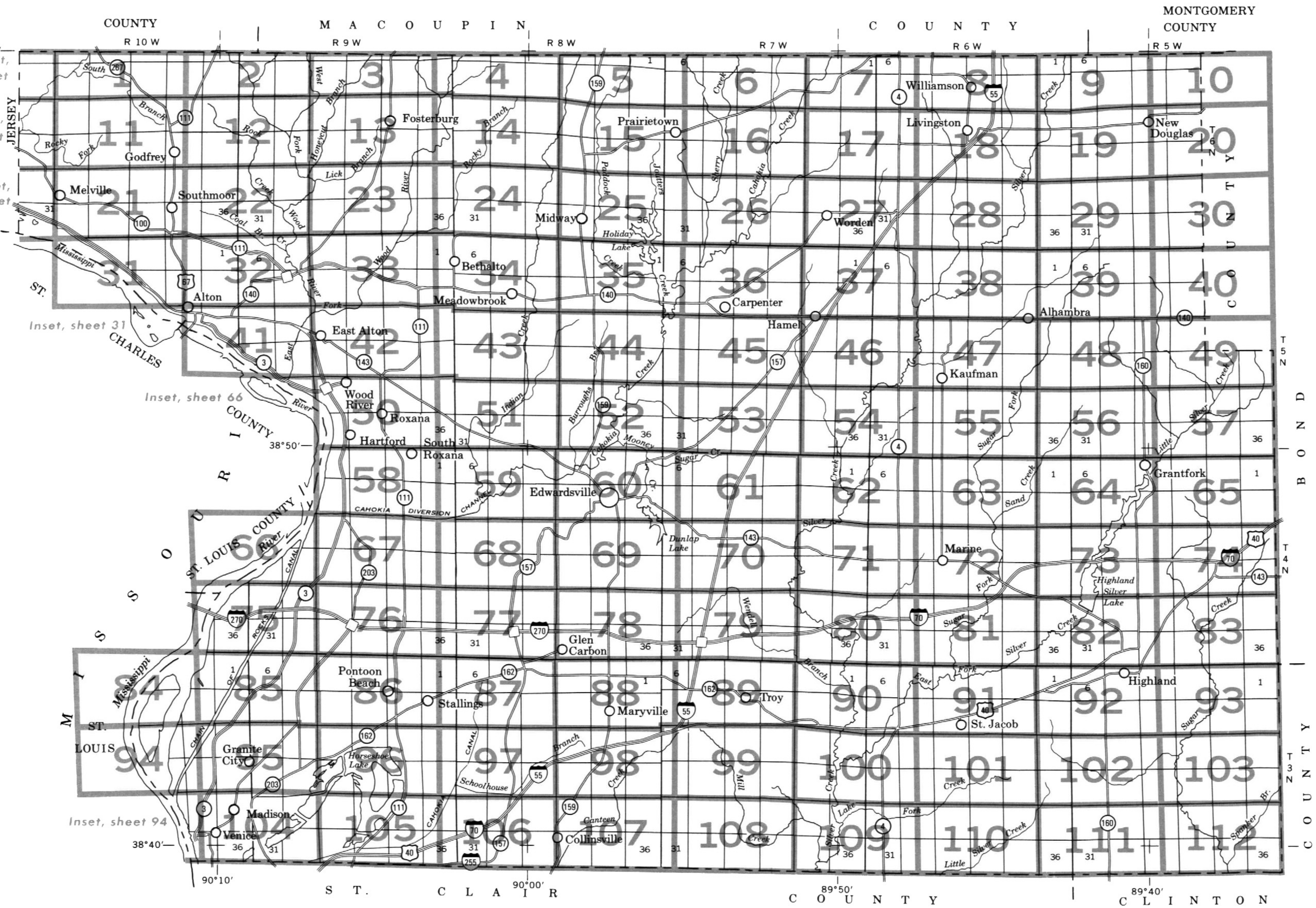
MADISON COUNTY, ILLINOIS

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS

MADISON COUNTY, ILLINOIS

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

SOIL LEGEND

Map symbols consist of numbers or a combination of numbers and a letter. The initial numbers represent the kind of soil. A capital letter following these numbers indicates the class of slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A final number of 2 following the slope letter indicates that the soil is eroded and 3 that it is severely eroded.

SYMBOLS	NAME
7D3	Atlas silty clay loam, 10 to 15 percent slopes, severely eroded
8E3	Hickory clay loam, 12 to 20 percent slopes, severely eroded
8F	Hickory silt loam, 15 to 30 percent slopes
16	Rushville silt loam
19D3	Sylvan silty clay loam, 10 to 15 percent slopes, severely eroded
35F	Bold silt loam, 15 to 30 percent slopes
37A	Worthen silt loam, 0 to 2 percent slopes
37B	Worthen silt loam, 2 to 5 percent slopes
41B	Muscatine silt loam, 1 to 4 percent slopes
46A	Herrick silt loam, 0 to 3 percent slopes
50	Virden silty clay loam
53B	Bloomfield loamy fine sand, 1 to 3 percent slopes
61B	Atterberry silt loam, 1 to 4 percent slopes
68	Sable silty clay loam
70	Beaucoup silty clay loam
71	Darwin silty clay
78	Arenzville silt loam
102A	La Hogue loam, 0 to 3 percent slopes
113B	Oconee silt loam, 1 to 5 percent slopes
119C3	Elco silty clay loam, 5 to 10 percent slopes, severely eroded
119D2	Elco silt loam, 10 to 15 percent slopes, eroded
119D3	Elco silty clay loam, 10 to 15 percent slopes, severely eroded
120	Huey silt loam
122B	Colp silt loam, 1 to 4 percent slopes
122C3	Colp silty clay loam, 4 to 10 percent slopes, severely eroded
127B	Harrison silt loam, 2 to 5 percent slopes
127C2	Harrison silt loam, 5 to 10 percent slopes, eroded
150A	Onarga sandy loam, 0 to 3 percent slopes
151	Ridgeville fine sandy loam
165	Weir silt loam
180	Dupo silt loam
214B	Hosmer silt loam, 2 to 5 percent slopes
242A	Kendall silt loam, 0 to 3 percent slopes
243B	St. Charles silt loam, 2 to 5 percent slopes
248	McFain silty clay
278A	Stronghurst silt loam, 0 to 2 percent slopes
278B	Stronghurst silt loam, 2 to 5 percent slopes
279B	Rozetta silt loam, 2 to 5 percent slopes
279B3	Rozetta silty clay loam, 2 to 5 percent slopes, severely eroded
279C2	Rozetta silt loam, 5 to 10 percent slopes, eroded
279C3	Rozetta silty clay loam, 5 to 10 percent slopes, severely eroded
279D3	Rozetta silty clay loam, 10 to 15 percent slopes, severely eroded
280B	Fayette silt loam, 2 to 5 percent slopes
280C2	Fayette silt loam, 5 to 10 percent slopes, eroded
280D2	Fayette silt loam, 10 to 15 percent slopes, eroded
280E3	Fayette silty clay loam, 15 to 20 percent slopes, severely eroded
280F	Fayette silt loam, 15 to 30 percent slopes
284	Tice silt loam
302	Ambraw loam
304B	Landes very fine sandy loam, 1 to 5 percent slopes
331	Haymond silt loam
333	Wakeland silt loam
334	Birds silt loam
338	Hurst silty clay loam
386B	Downs silt loam, 2 to 5 percent slopes
386C2	Downs silt loam, 5 to 10 percent slopes, eroded
409	Aquents, clayey

SYMBOLS	NAME
415	Orion silt loam
430A	Raddle silt loam, 0 to 3 percent slopes
430B	Raddle silt loam, 3 to 6 percent slopes
451	Lawson silt loam
452A	Riley clay loam, 0 to 3 percent slopes
474	Piasa silt loam
517A	Marine silt loam, 0 to 2 percent slopes
517B	Marine silt loam, 2 to 5 percent slopes
533	Urban land
536	Dumps
581B2	Tamalco silt loam, 2 to 5 percent slopes, eroded
583B	Pike silt loam, 2 to 5 percent slopes
583C2	Pike silt loam, 5 to 10 percent slopes, eroded
583D2	Pike silt loam, 10 to 15 percent slopes, eroded
585E	Negley loam, 15 to 25 percent slopes
592A	Nameoki silty clay, 0 to 3 percent slopes
620B2	Darmstadt silt loam, 2 to 5 percent slopes, eroded
620C3	Darmstadt silty clay loam, 3 to 8 percent slopes, severely eroded
741B	Oakville fine sand, 2 to 5 percent slopes
741C	Oakville fine sand, 5 to 10 percent slopes
801B	Orthents, silty, undulating
801E	Orthents, silty, steep
802B	Orthents, loamy, undulating
802E	Orthents, loamy, steep
864	Pits, quarries
865	Pits, gravel
867	Oil-waste land
914C3	Atlas-Grantfork silty clay loams, 5 to 10 percent slopes, severely eroded
914D3	Atlas-Grantfork silty clay loams, 10 to 15 percent slopes, severely eroded
916B	Darmstadt-Oconee silt loams, 1 to 5 percent slopes
920	Rushville-Huey silt loams
936F	Fayette-Hickory complex, 15 to 30 percent slopes
941	Virden-Piasa silt loams
962E2	Sylvan-Bold silt loams, 15 to 20 percent slopes, eroded
962F	Sylvan-Bold silt loams, 20 to 30 percent slopes
967F	Hickory-Gosport silt loams, 15 to 30 percent slopes
993	Cowden-Piasa silt loams
995	Herrick-Piasa silt loams
1070	Beaucoup silty clay loam, wet
1071	Darwin silty clay, wet
2041B	Muscatine-Urban land complex, 1 to 4 percent slopes
2071	Darwin-Urban land complex
2113B	Oconee-Urban land complex, 1 to 4 percent slopes
2122B	Colp-Urban land complex, 1 to 5 percent slopes
2279B	Rozetta-Urban land complex, 2 to 8 percent slopes
2280D	Fayette-Urban land complex, 8 to 15 percent slopes
2284	Tice-Urban land complex
2304B	Landes-Urban land complex, 0 to 5 percent slopes
2452A	Riley-Urban land complex, 0 to 3 percent slopes
2592A	Nameoki-Urban land complex, 0 to 3 percent slopes
2741B	Oakville-Urban land complex, 1 to 6 percent slopes
3070	Beaucoup silty clay loam, frequently flooded
3071	Darwin silty clay, frequently flooded
3092B	Sarpy Variant loamy fine sand, frequently flooded, 0 to 6 percent slopes
3284	Tice silt loam, frequently flooded
3592A	Nameoki silty clay loam, frequently flooded, 0 to 3 percent slopes
6092B	Sarpy Variant loamy fine sand, 0 to 6 percent slopes
6304A	Landes Variant very fine sandy loam, 0 to 3 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Reservation (national forest or park, state forest or park, and large airport)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield,

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads

ROAD EMBLEMS & DESIGNATIONS

- Interstate 79
- Federal 410
- State 52

RAILROAD

LEVEES

- Without road

DAMS

- Large (to scale)
- Medium or small water

PITS

- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Indian mound

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
- Double-line (label) CANAL
- Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial water w

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS 279C3 278A

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

SOIL SAMPLE SITE

MISCELLANEOUS

- Rock outcrop (includes sandstone and shale)
- Severely eroded spot
- Calcareous spot
- Glacial till spot

1

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

2

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 2

4000 AND 5000-FOOT GRID TICKS

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

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MADISON COUNTY, ILLINOIS — SHEET NUMBER 3

3

N

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1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

4

N

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1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 6

N

4000 AND 5000-FOOT GRID TICKS

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1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

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1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 8

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

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N

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

4000 AND 5000 FOOT GRID TICKS

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

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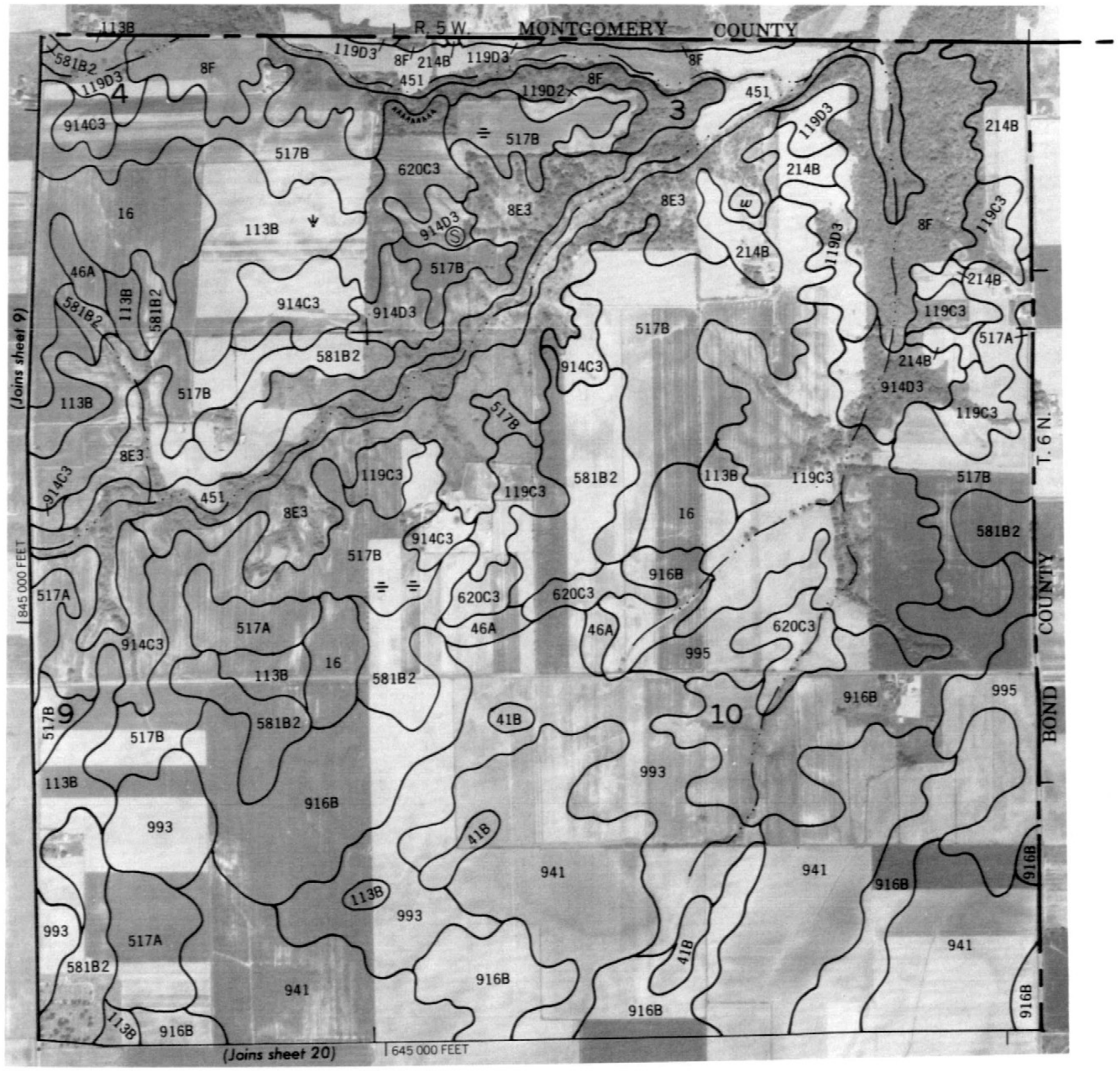
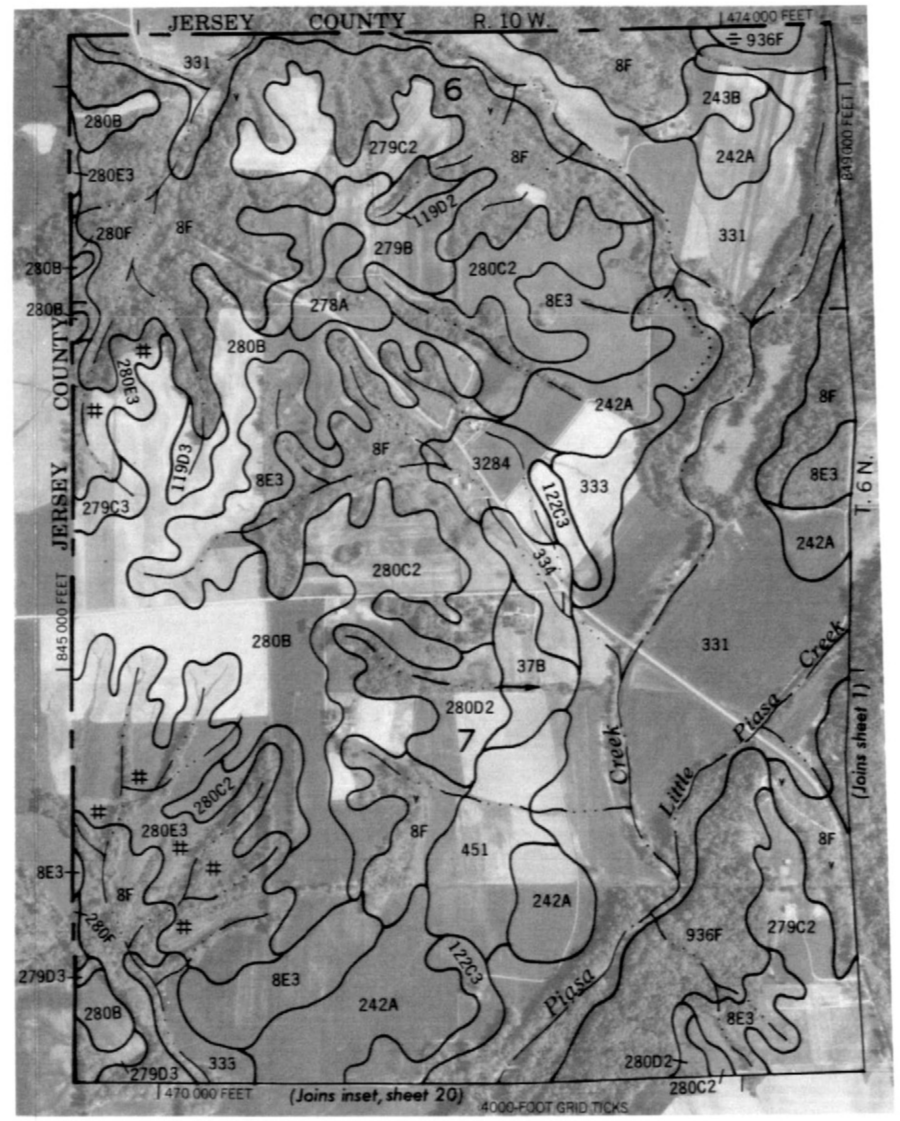


4000 AND 5000-FOOT GRID TICKS



Scale 1:15 840

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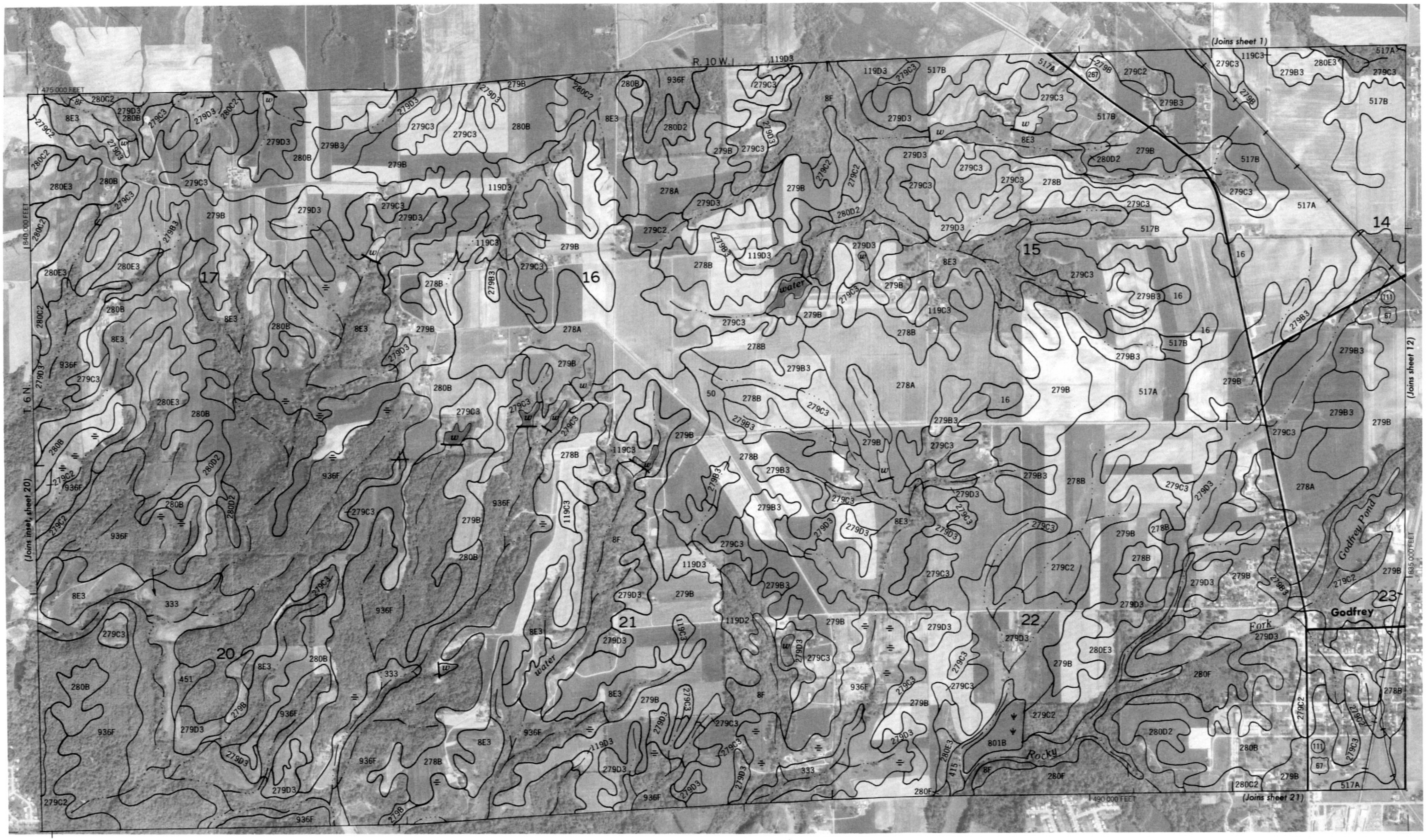
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

11

N



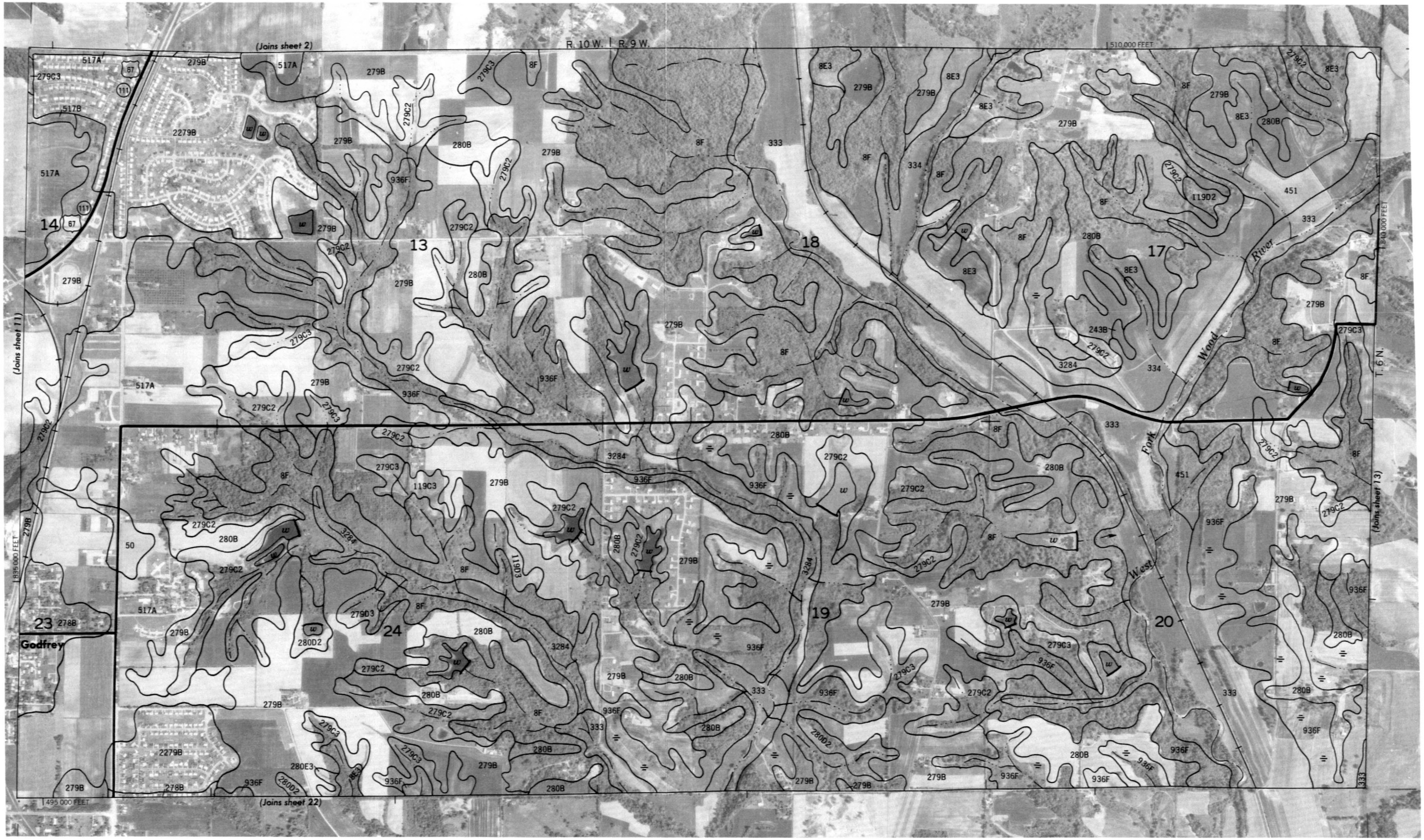
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

13

N

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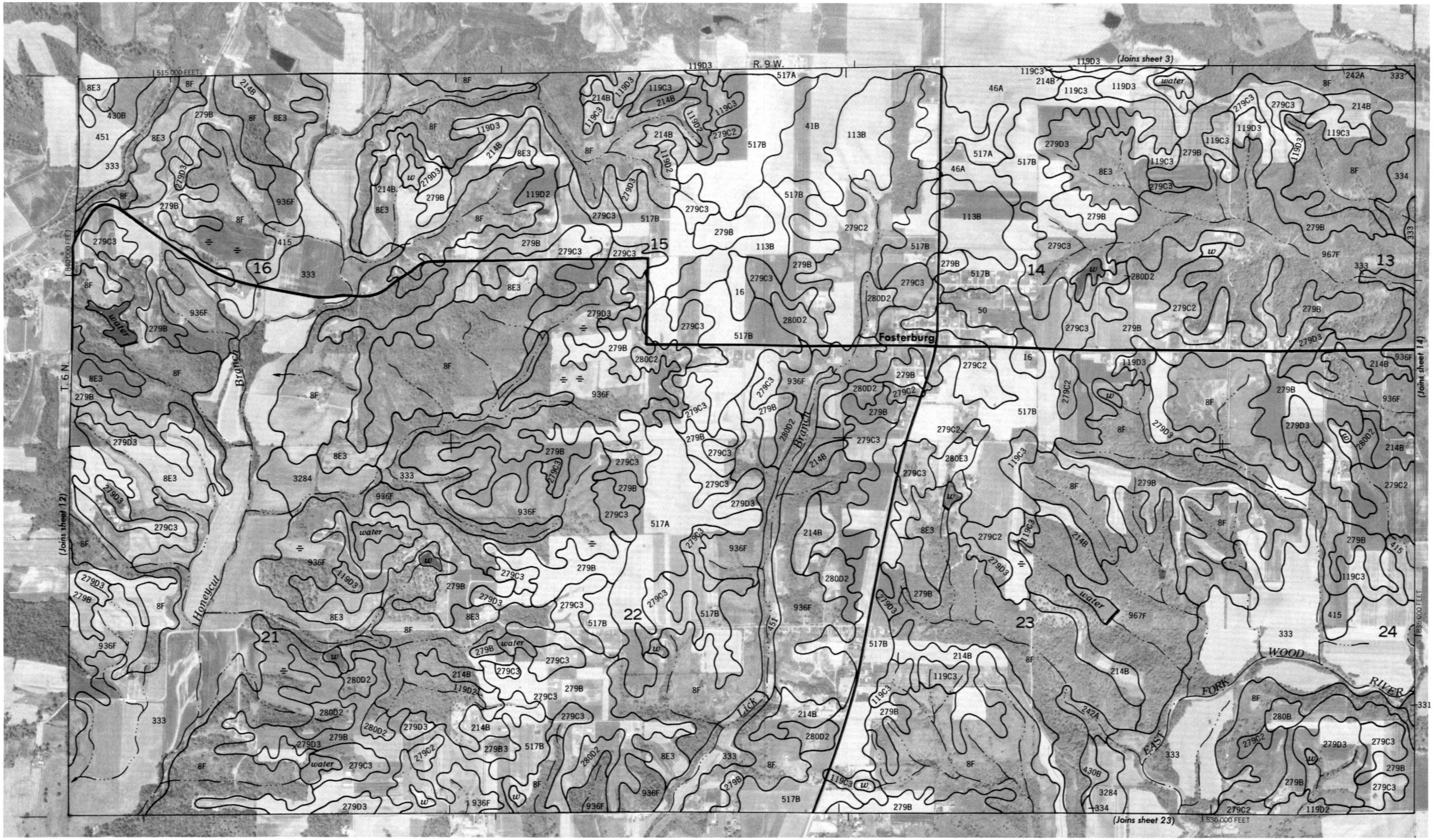


1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

(14)

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

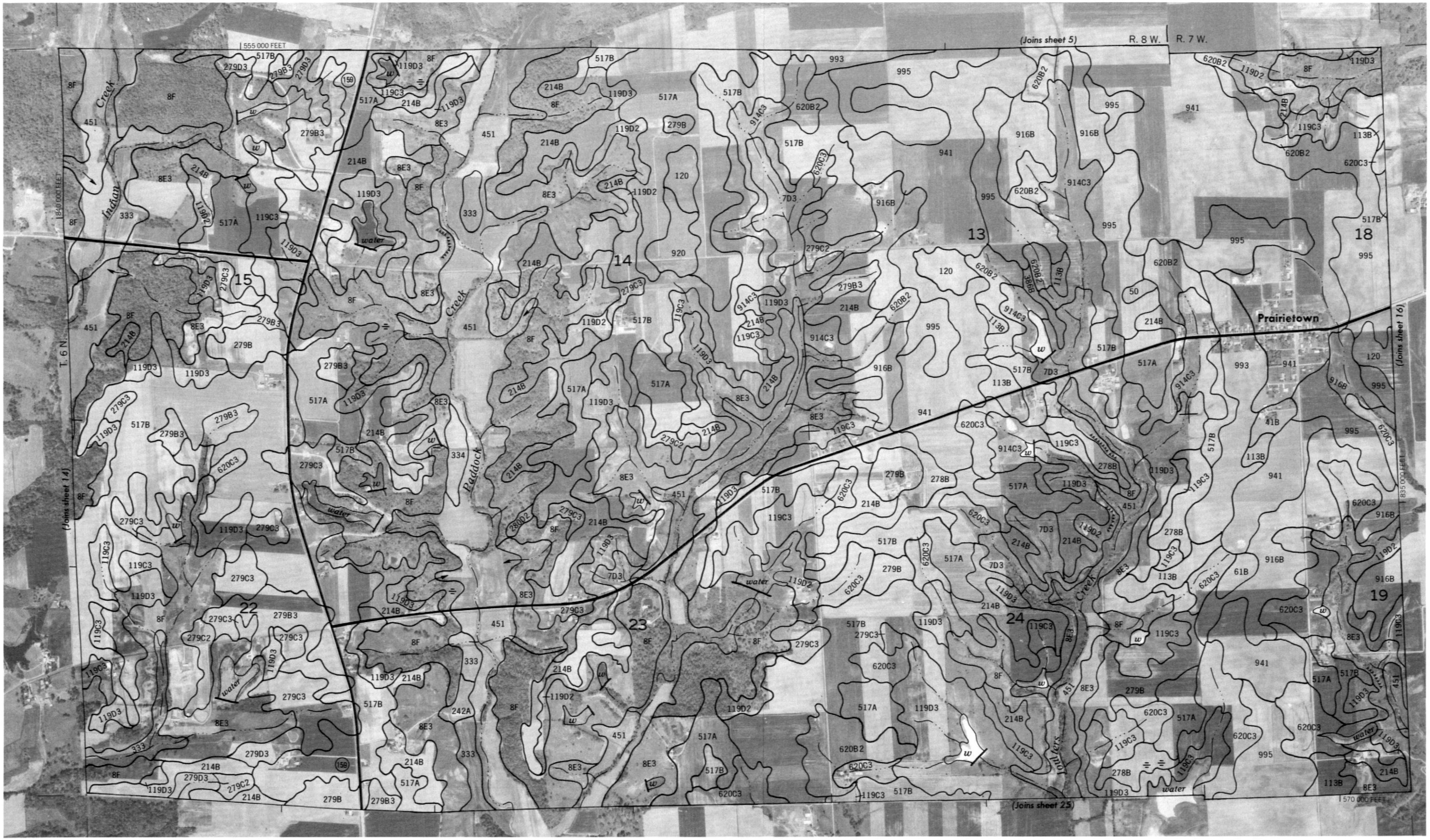
Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

15

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 16

N

1 ¾ ½ ¼ 0 1 Mile

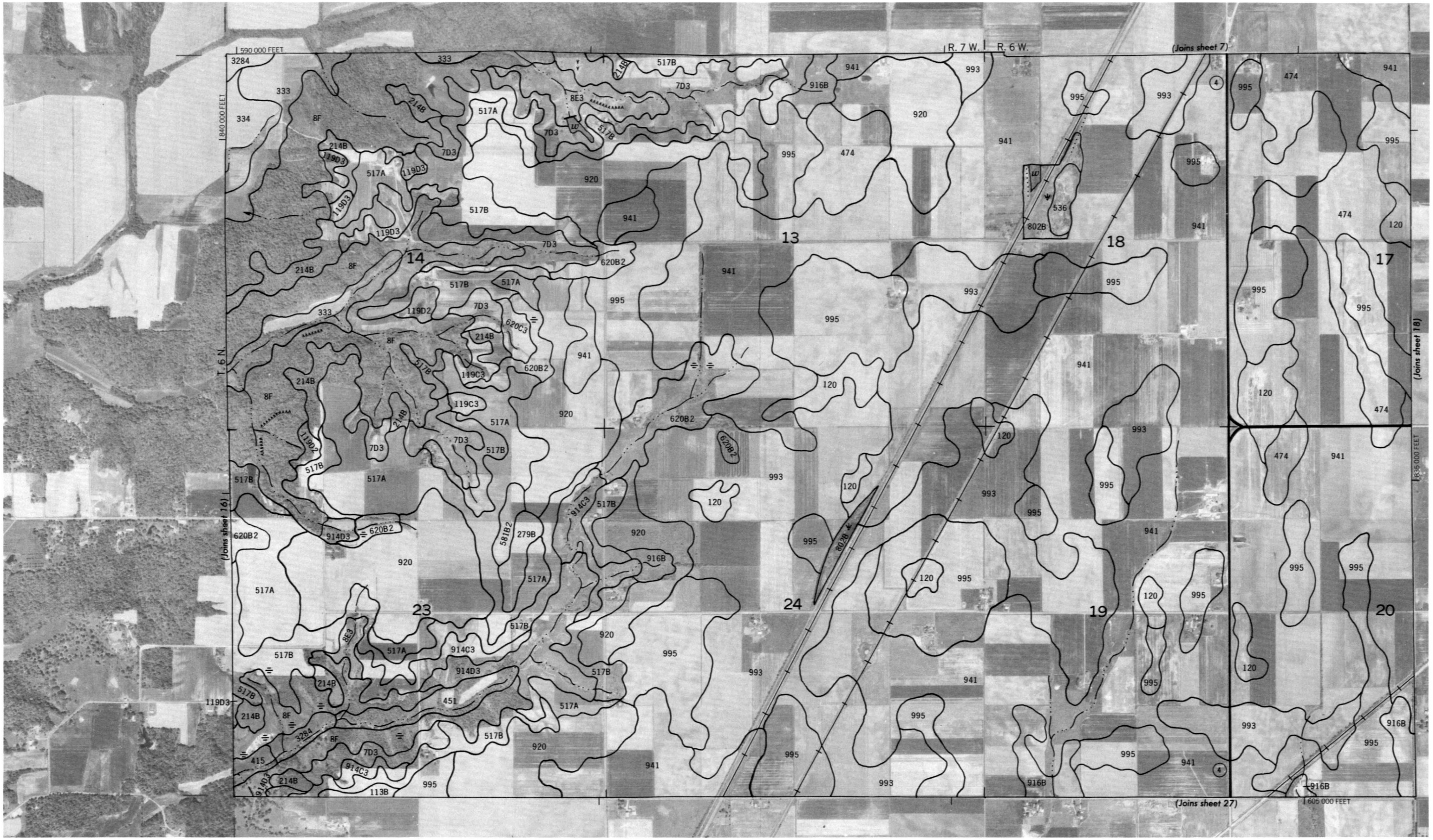
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

17

N



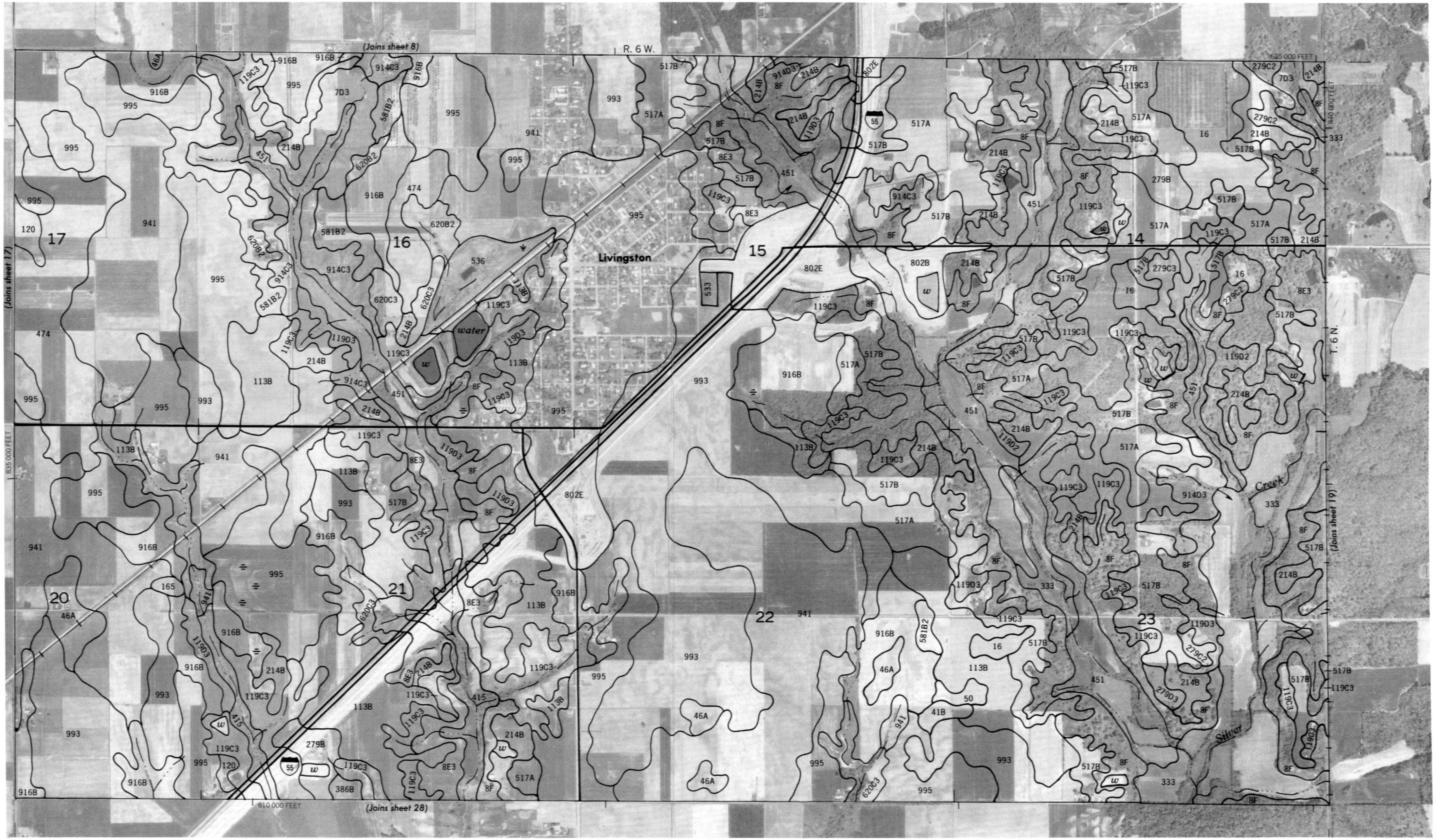
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



1 ¾ ½ ¼ 0 1 Mile

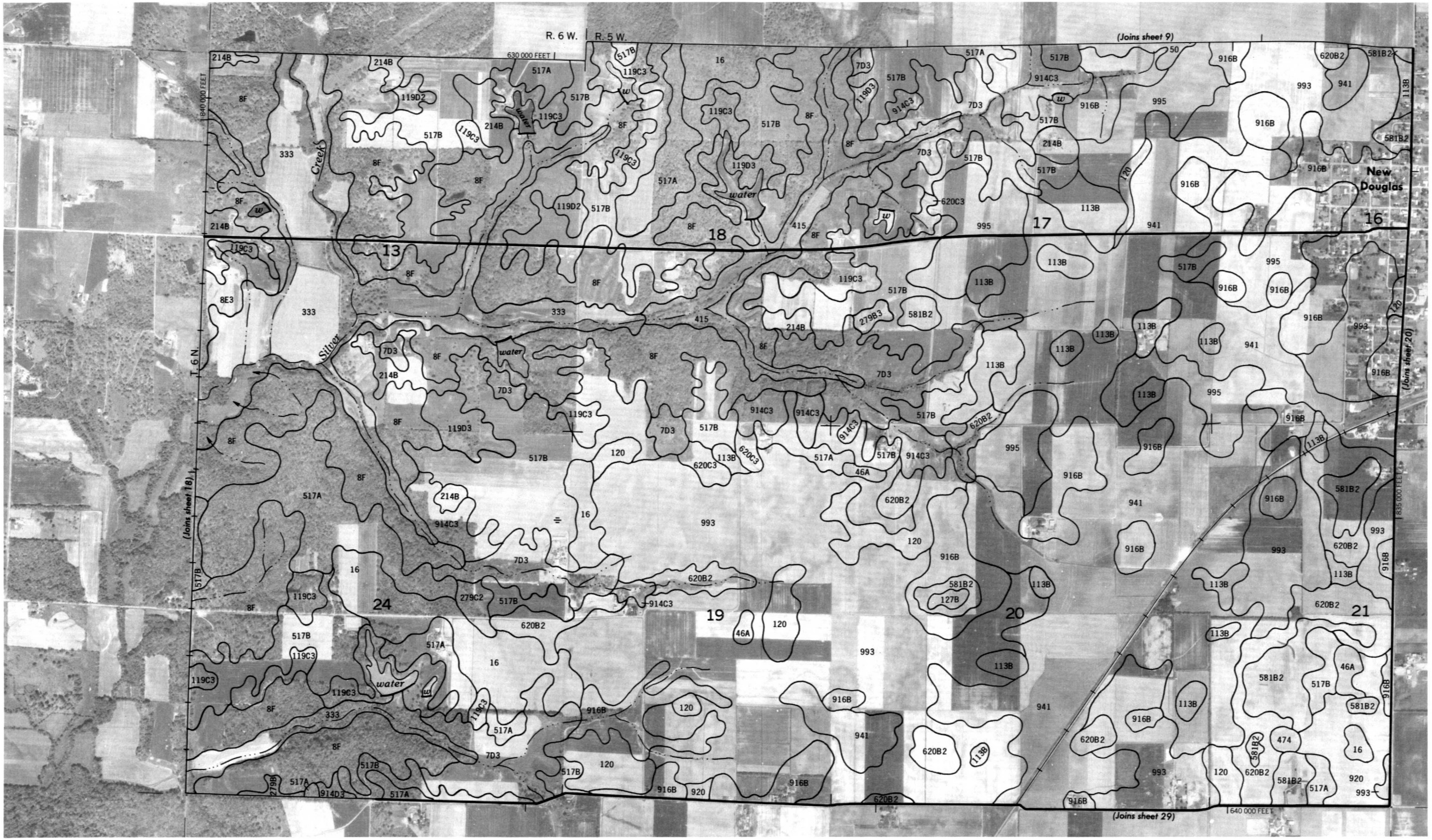
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

19

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

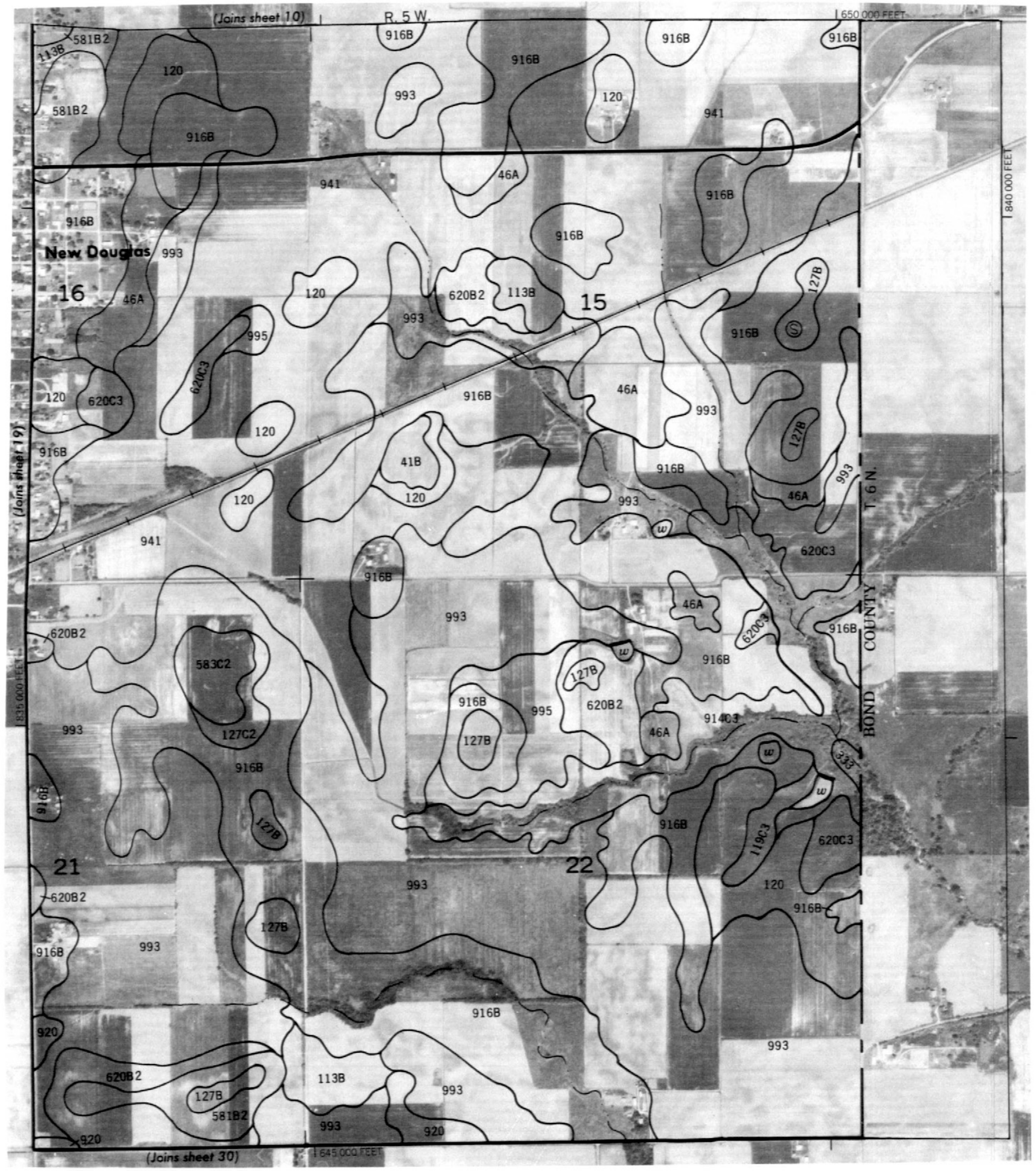
1 ¾ ½ ¼ 0 1 Mile

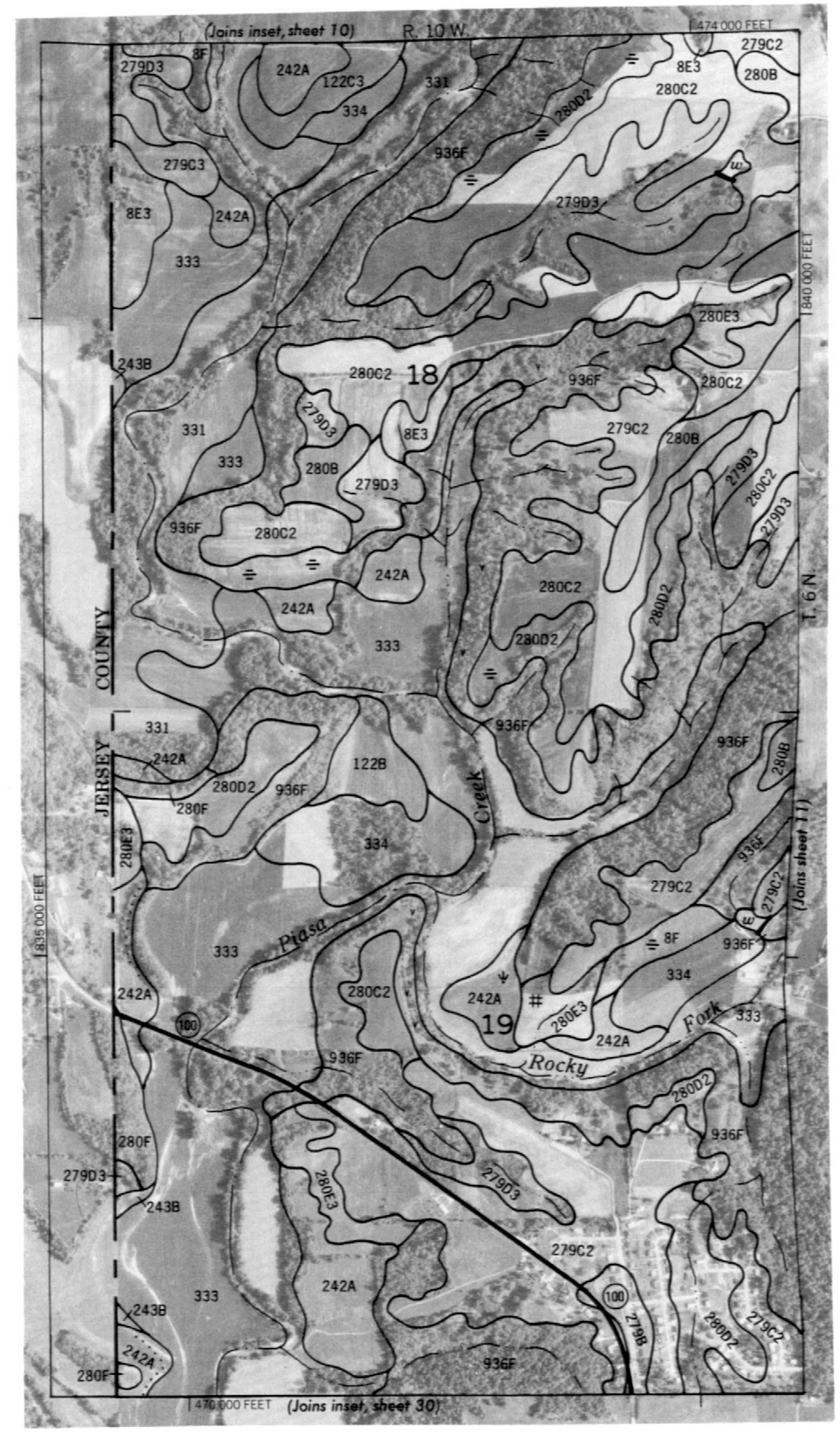
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 20

N





4000 AND 5000-FOOT GRID TICKS

1 ¾ ½ ¼ 0 1 Mile

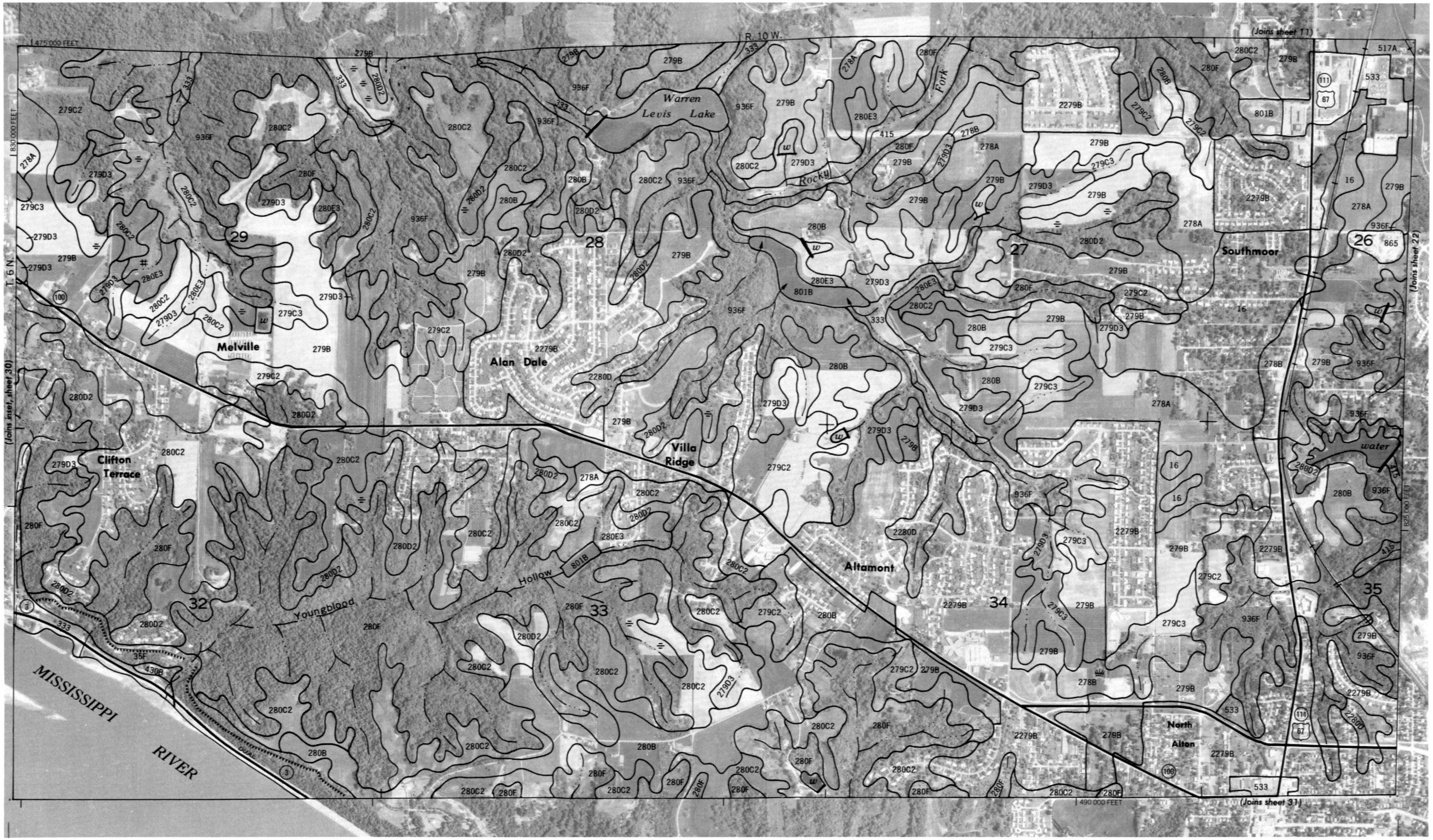
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 22

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

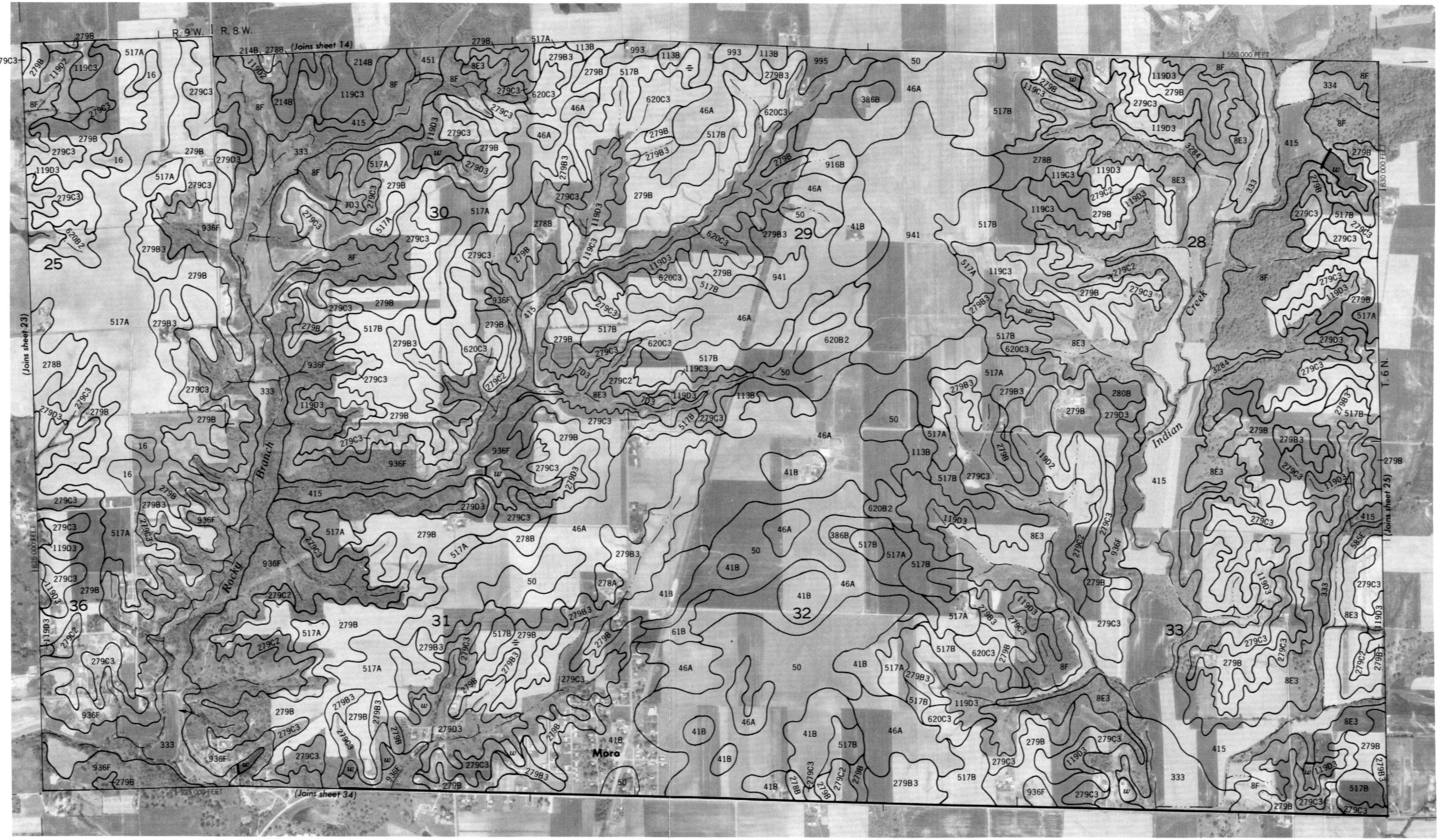
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

24

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

25

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

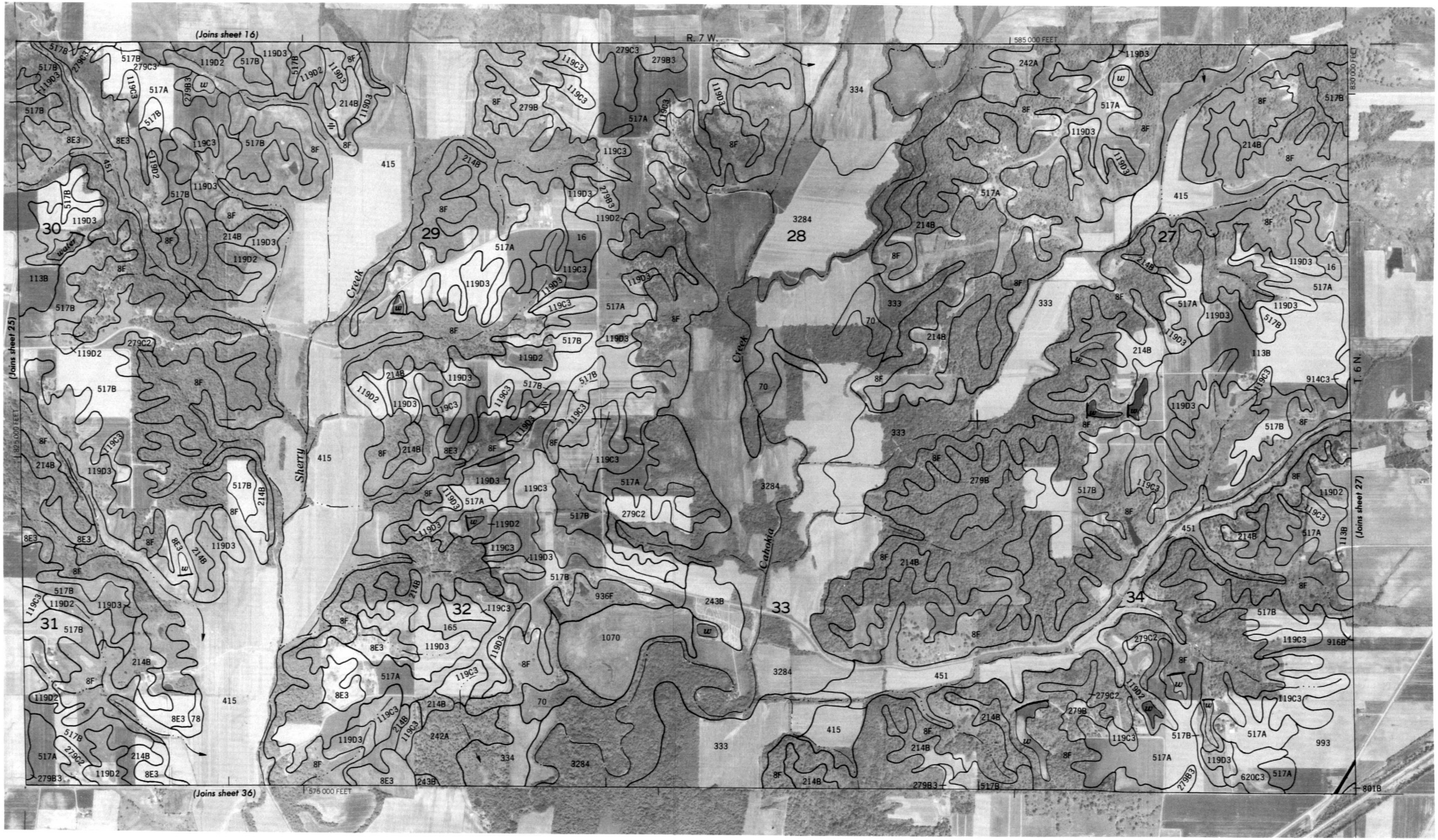
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 26

N



1 ¾ ½ ¼ 0 1 Mile
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet
Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

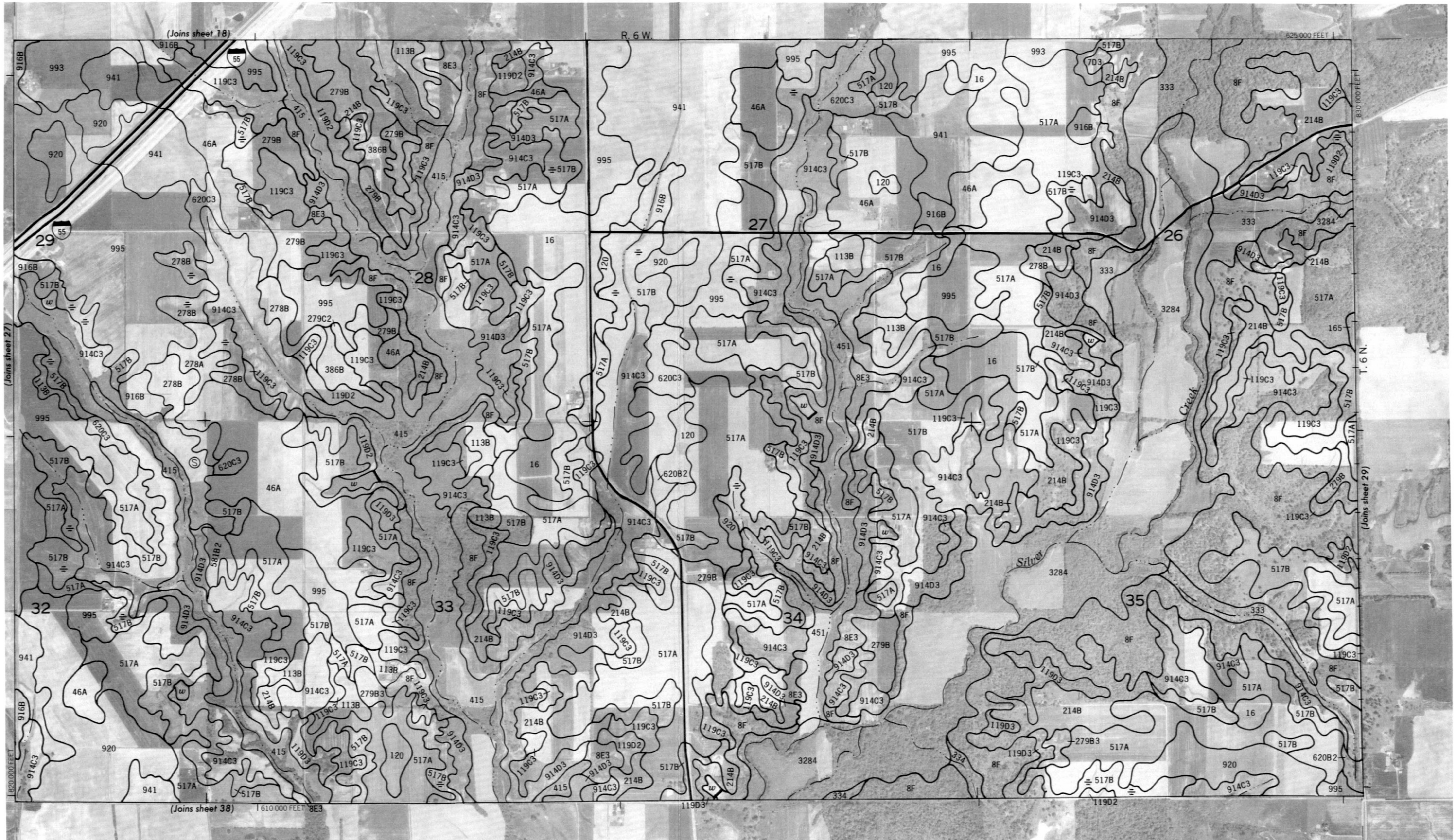
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 28

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

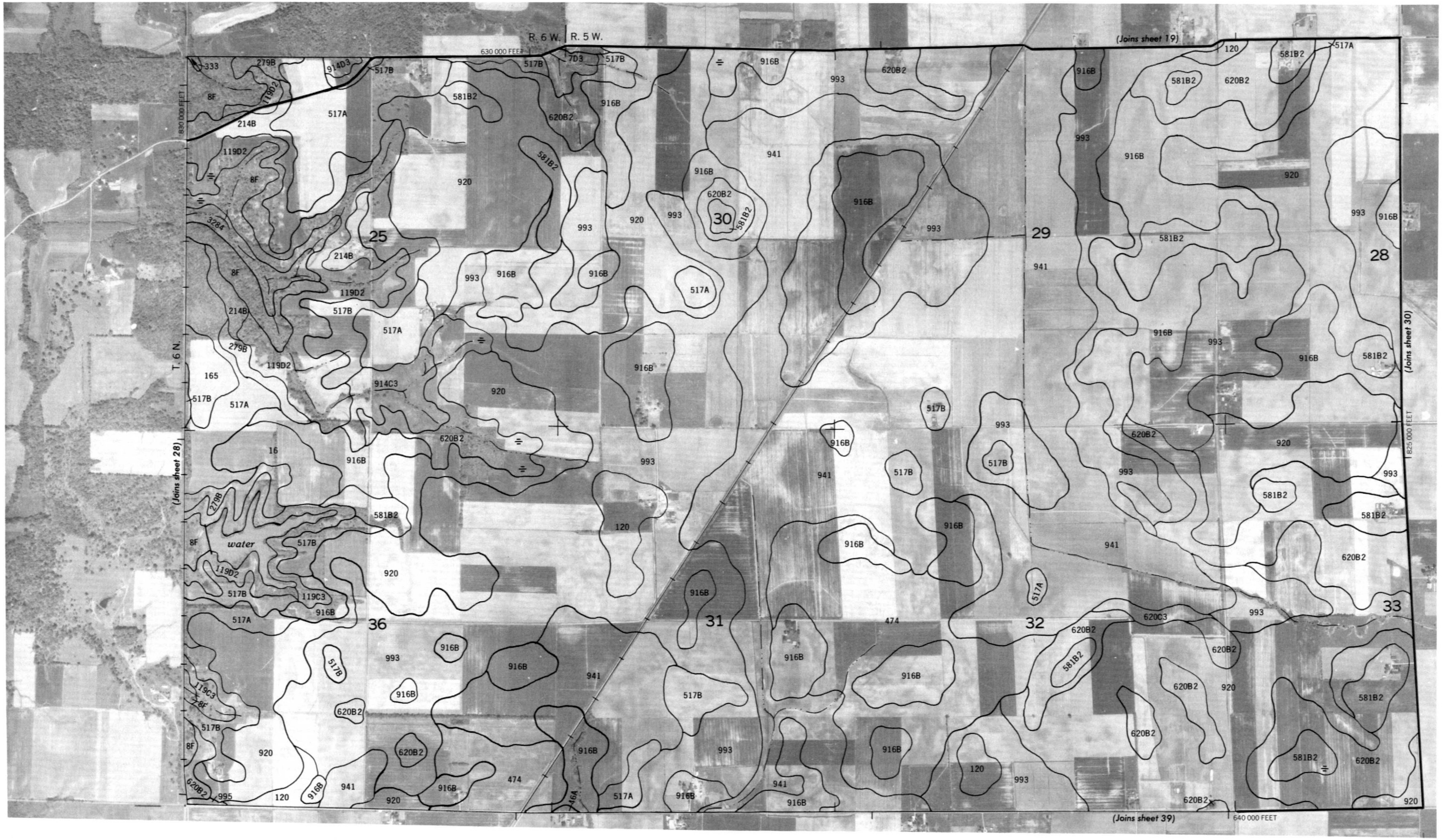
Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

29

N

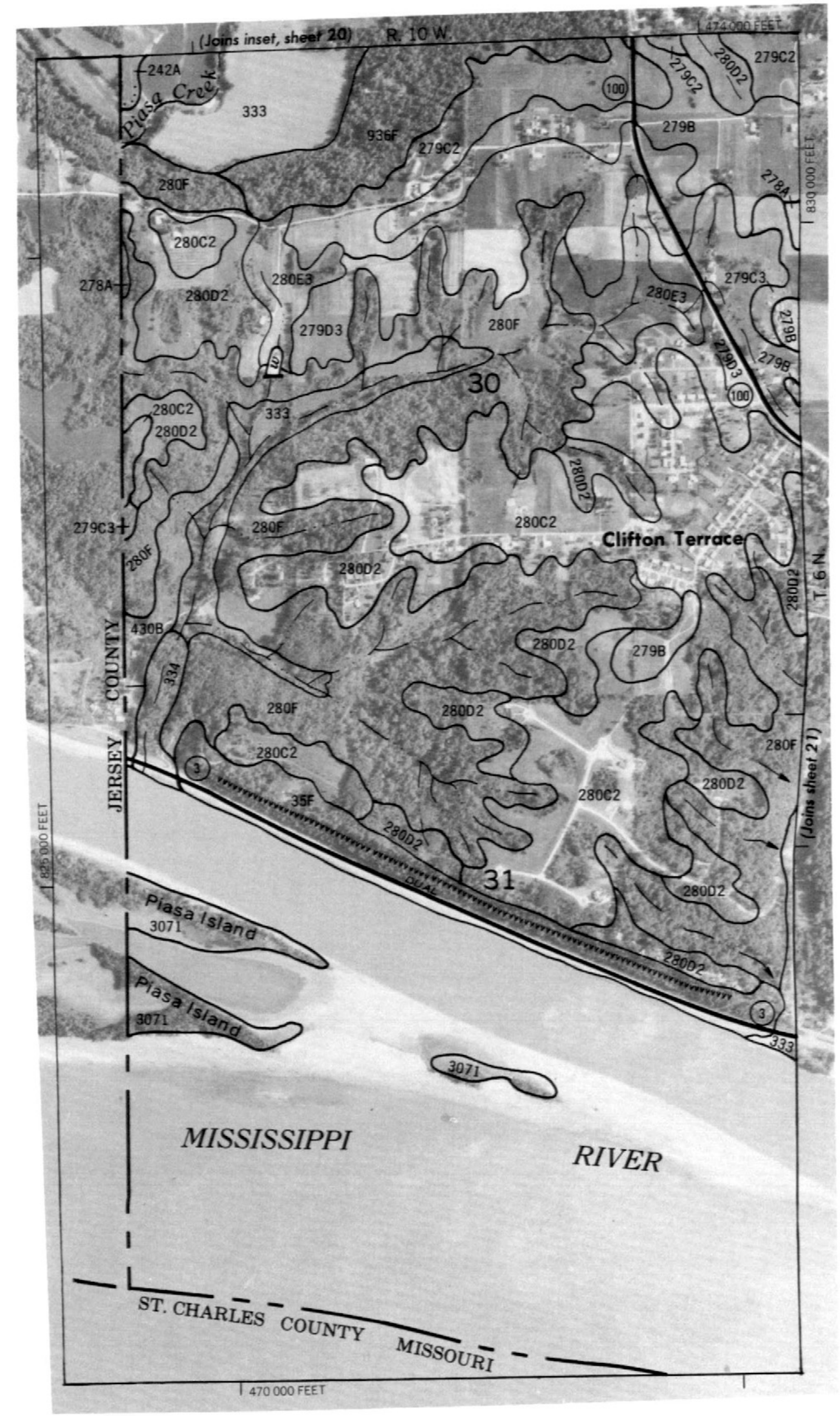
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840



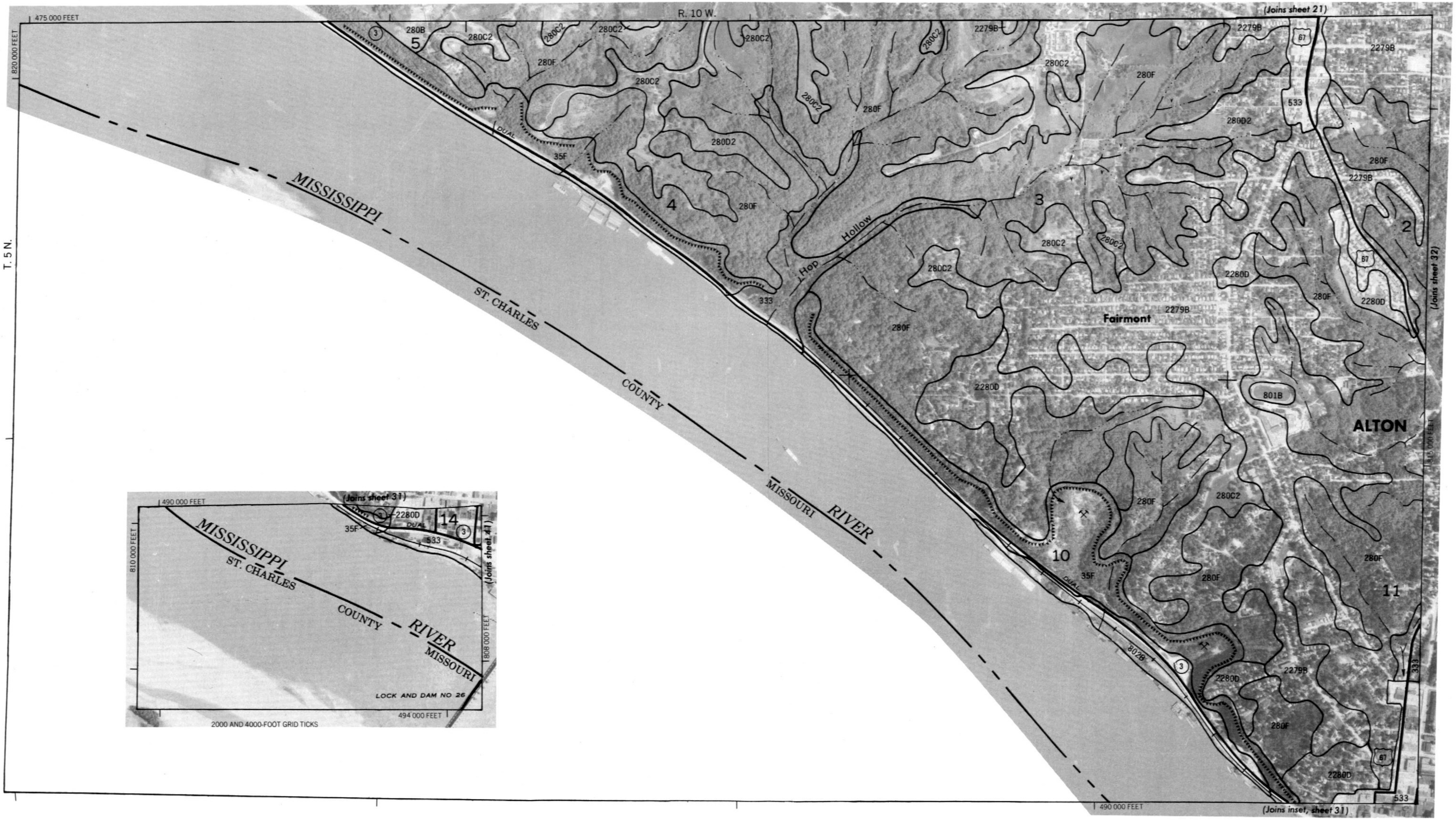
4000 AND 5000-FOOT GRID TICKS

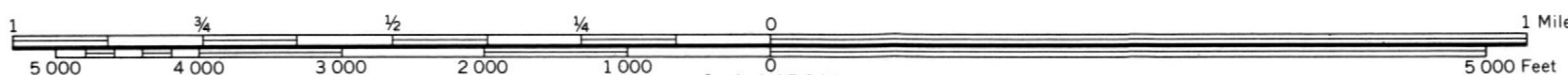
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



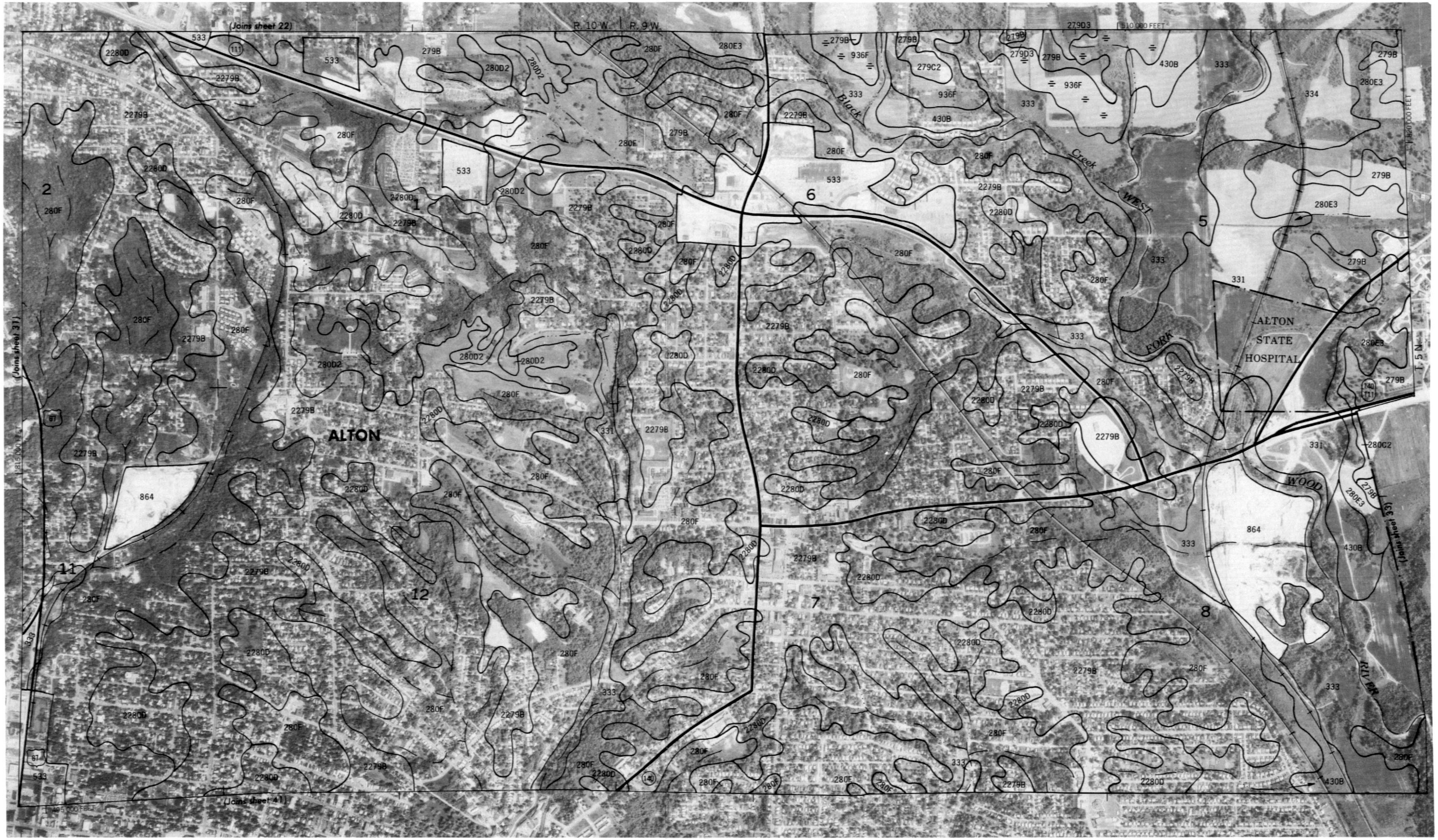


Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

32

N



1 ¾ ½ ¼ 0 1 Mile

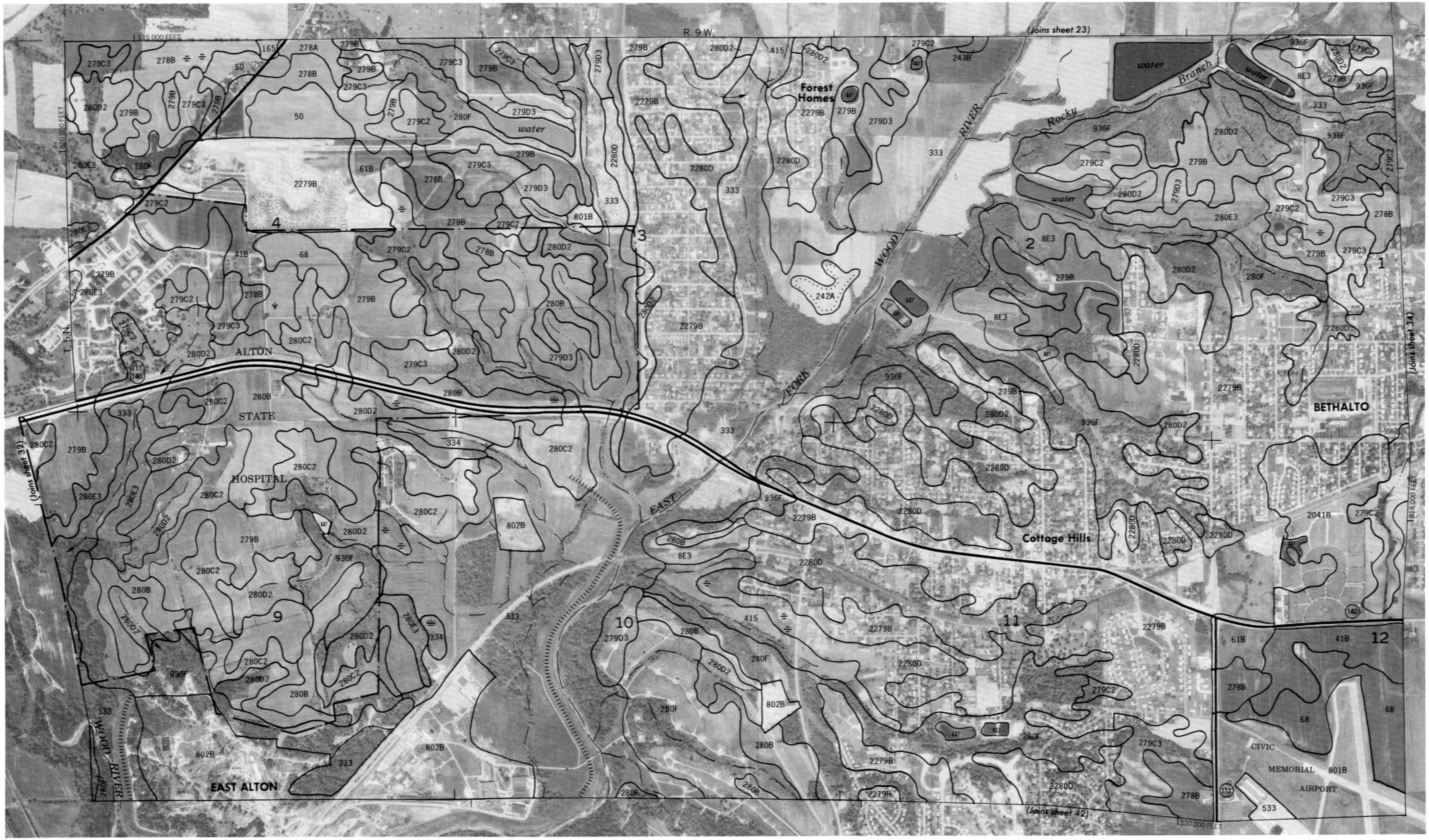
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

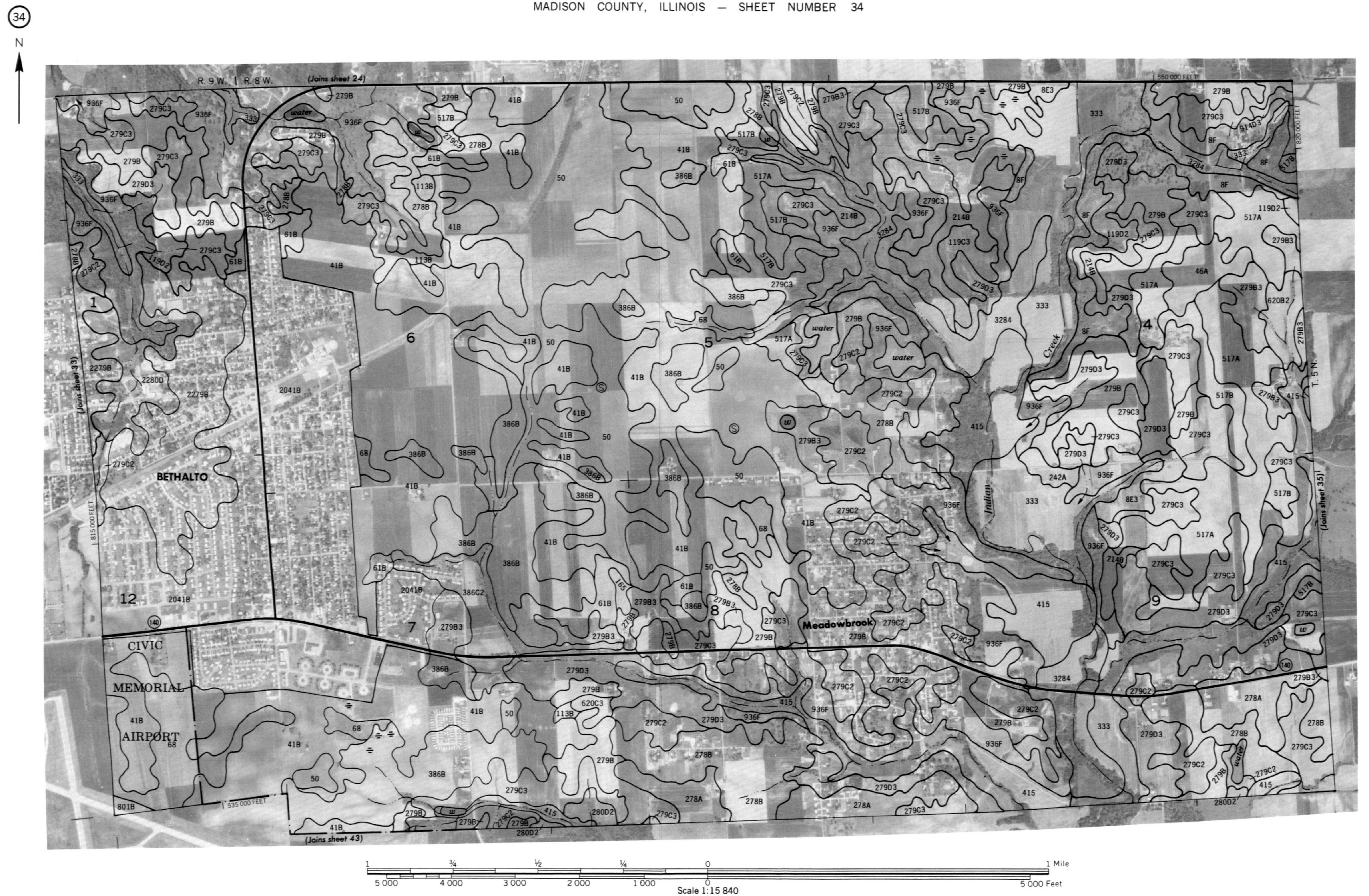
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

36

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

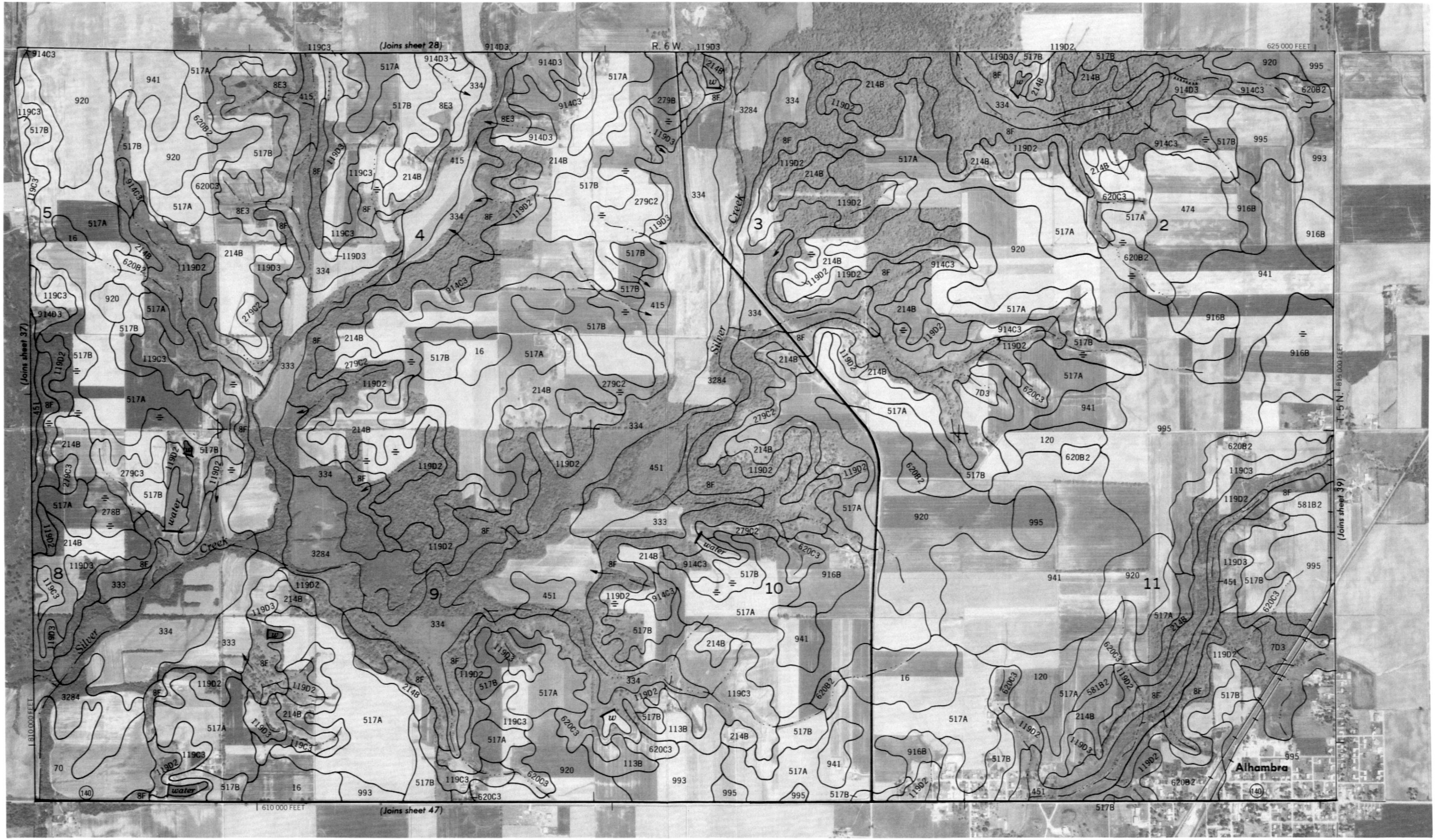
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

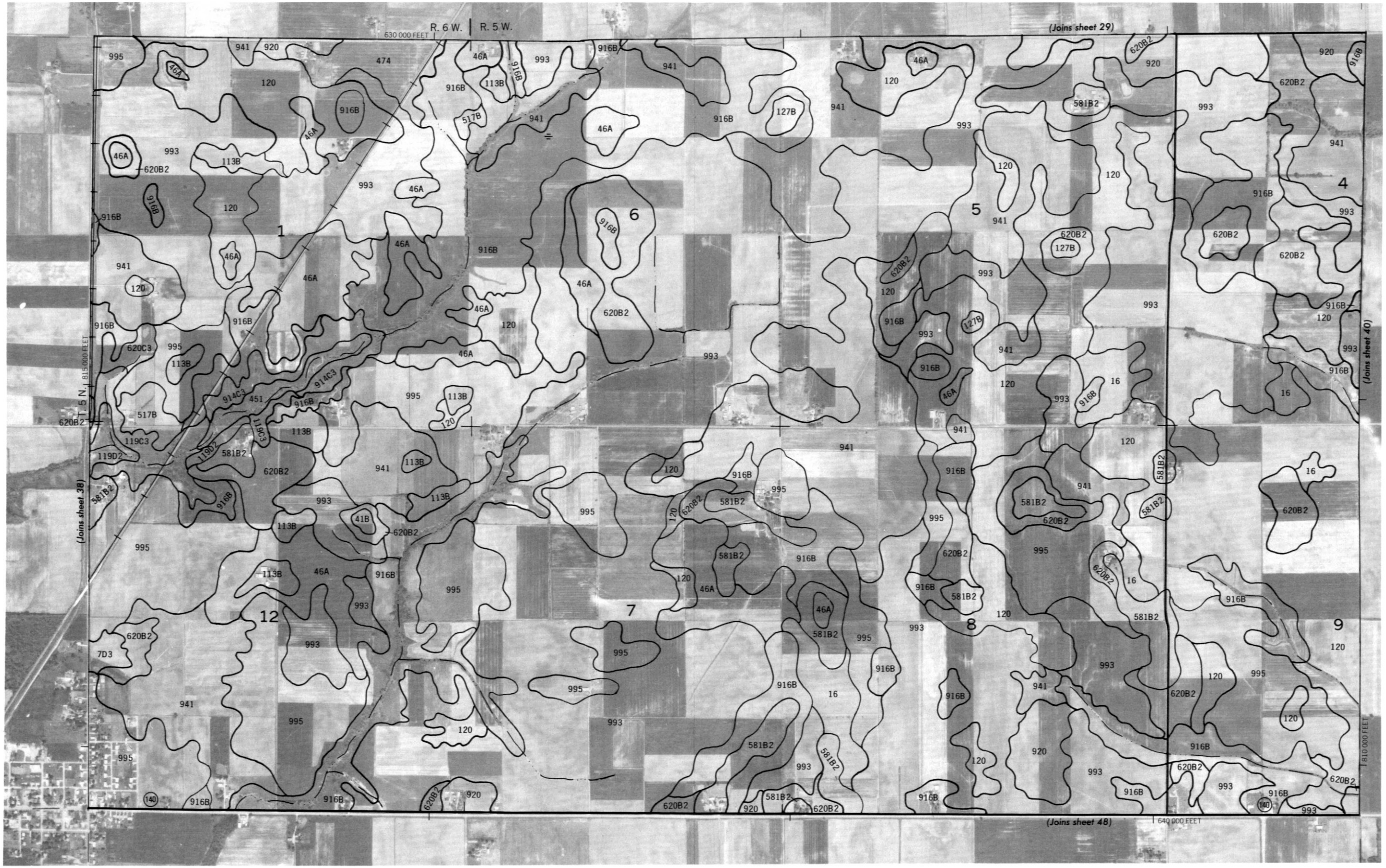
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 40

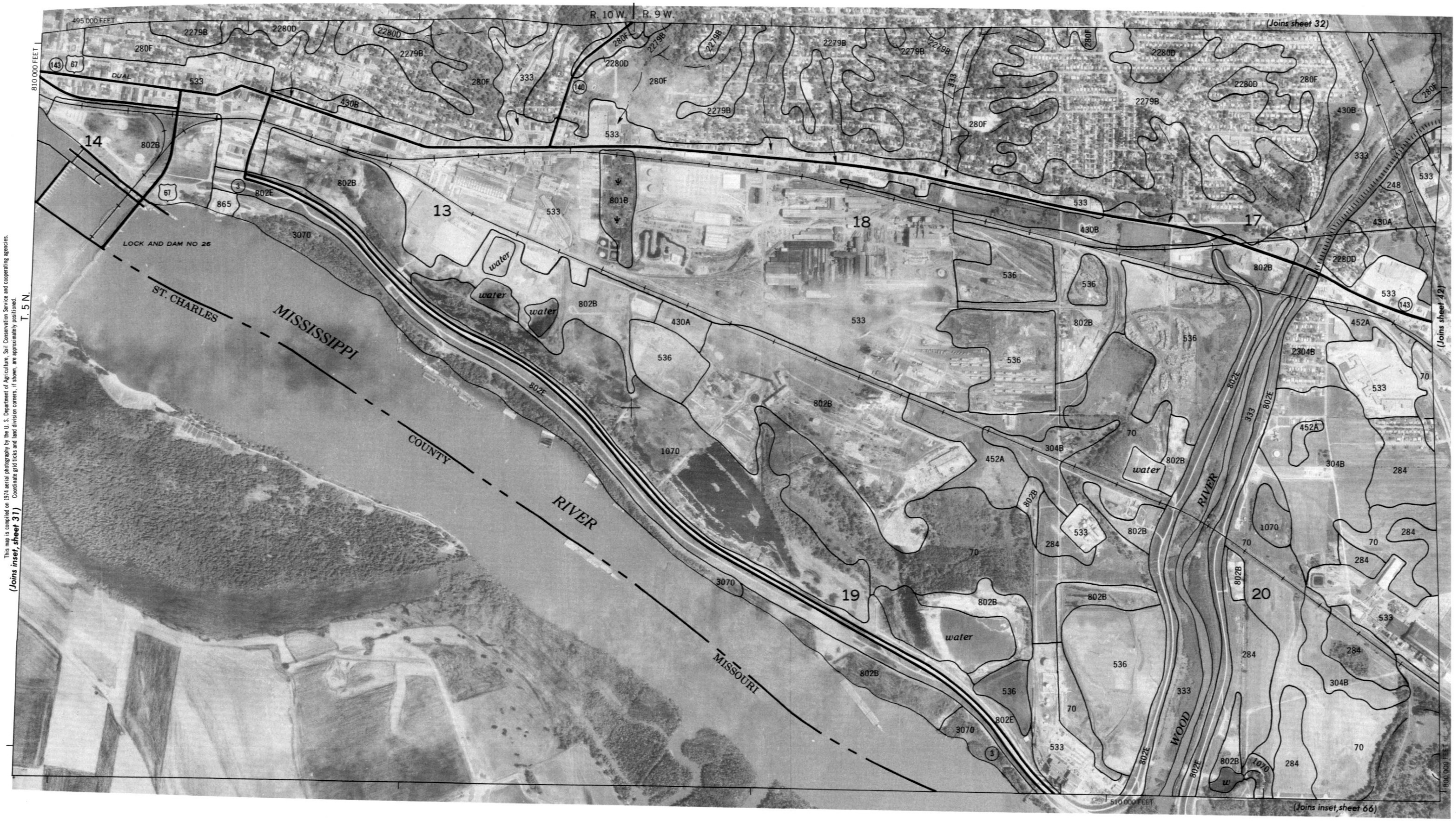
N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

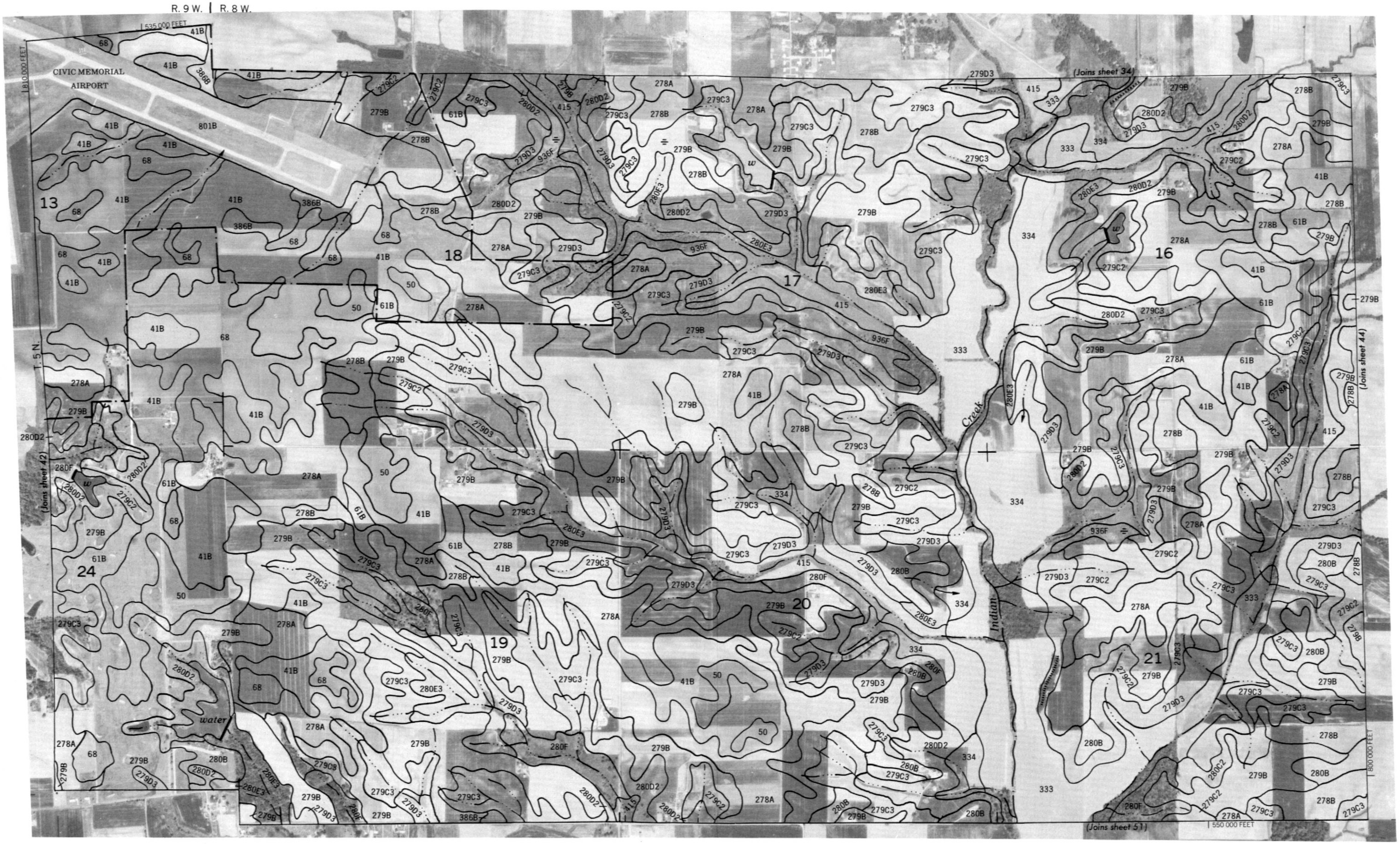
N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 — ¾ — ½ — ¼ — 0 — 1 Mile

5 000 — 4 000 — 3 000 — 2 000 — 1 000 — 0 — 5 000 Feet

Scale 1:15 840

44

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 — ¾ — ½ — ¼ — 0 — 1 Mile
5 000 — 4 000 — 3 000 — 2 000 — 1 000 — 0 — 5 000 Feet
Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 46

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

47

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

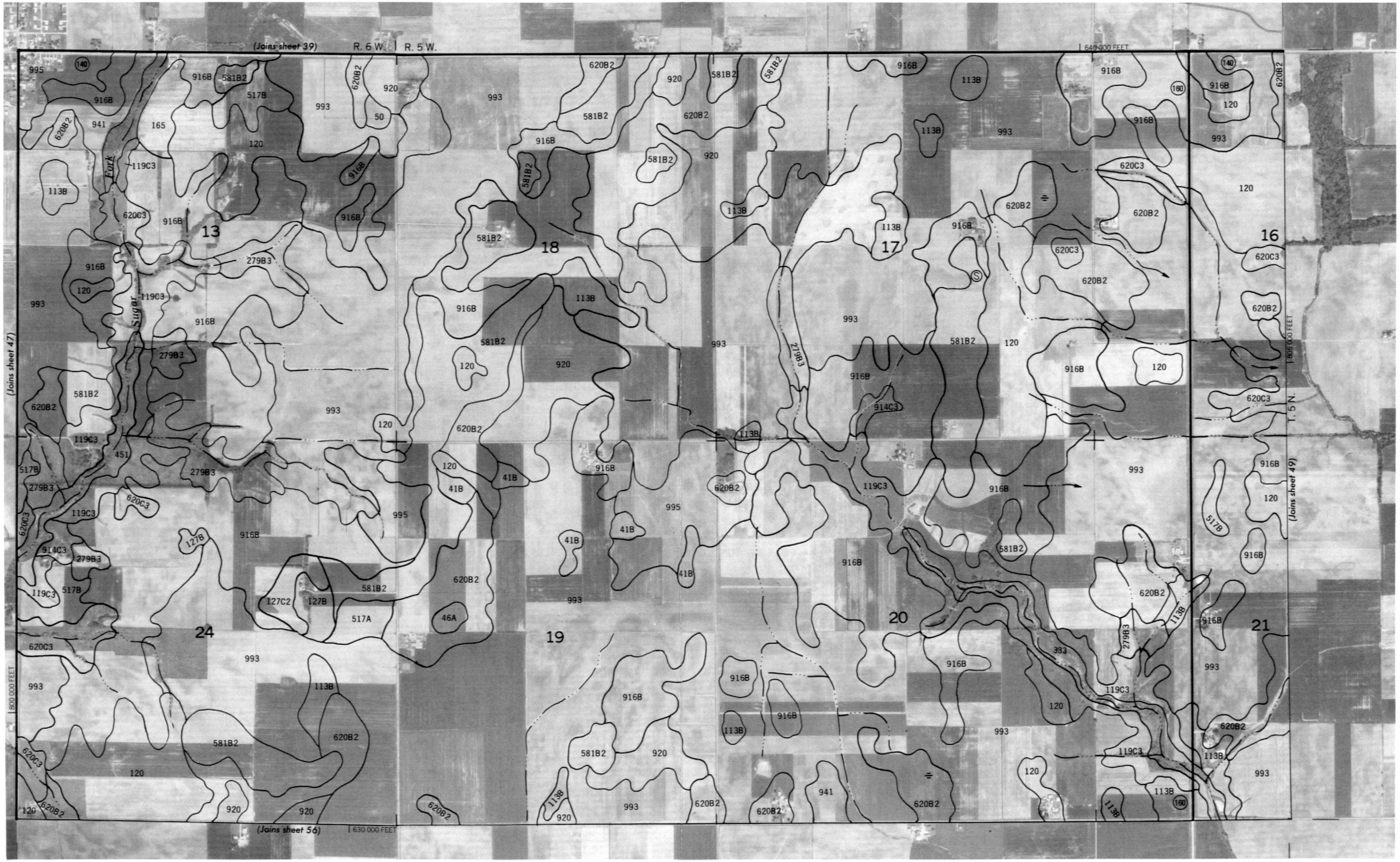
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

48

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

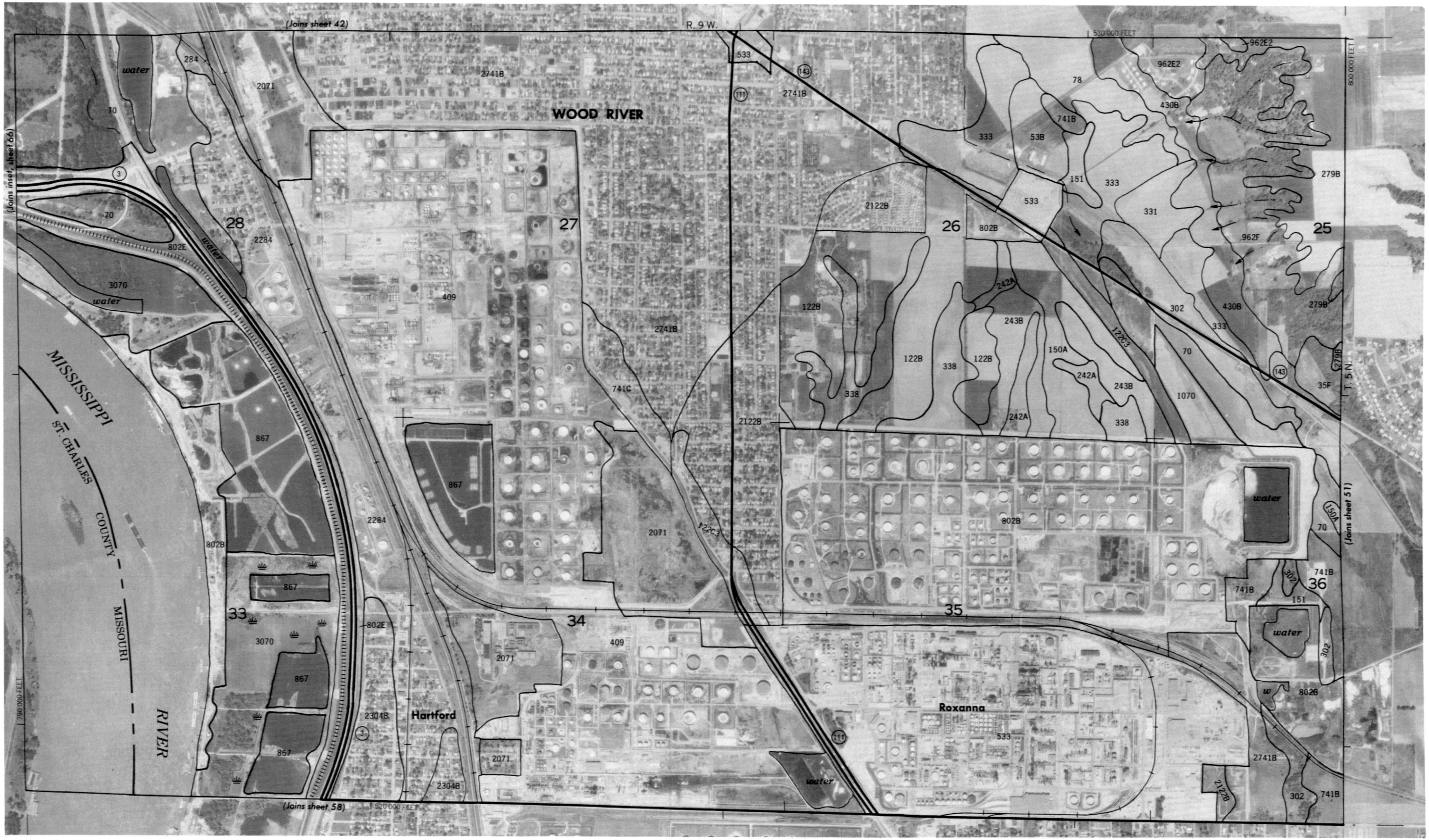
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



1 — ¾ — ½ — ¼ — 0 — 1 Mile

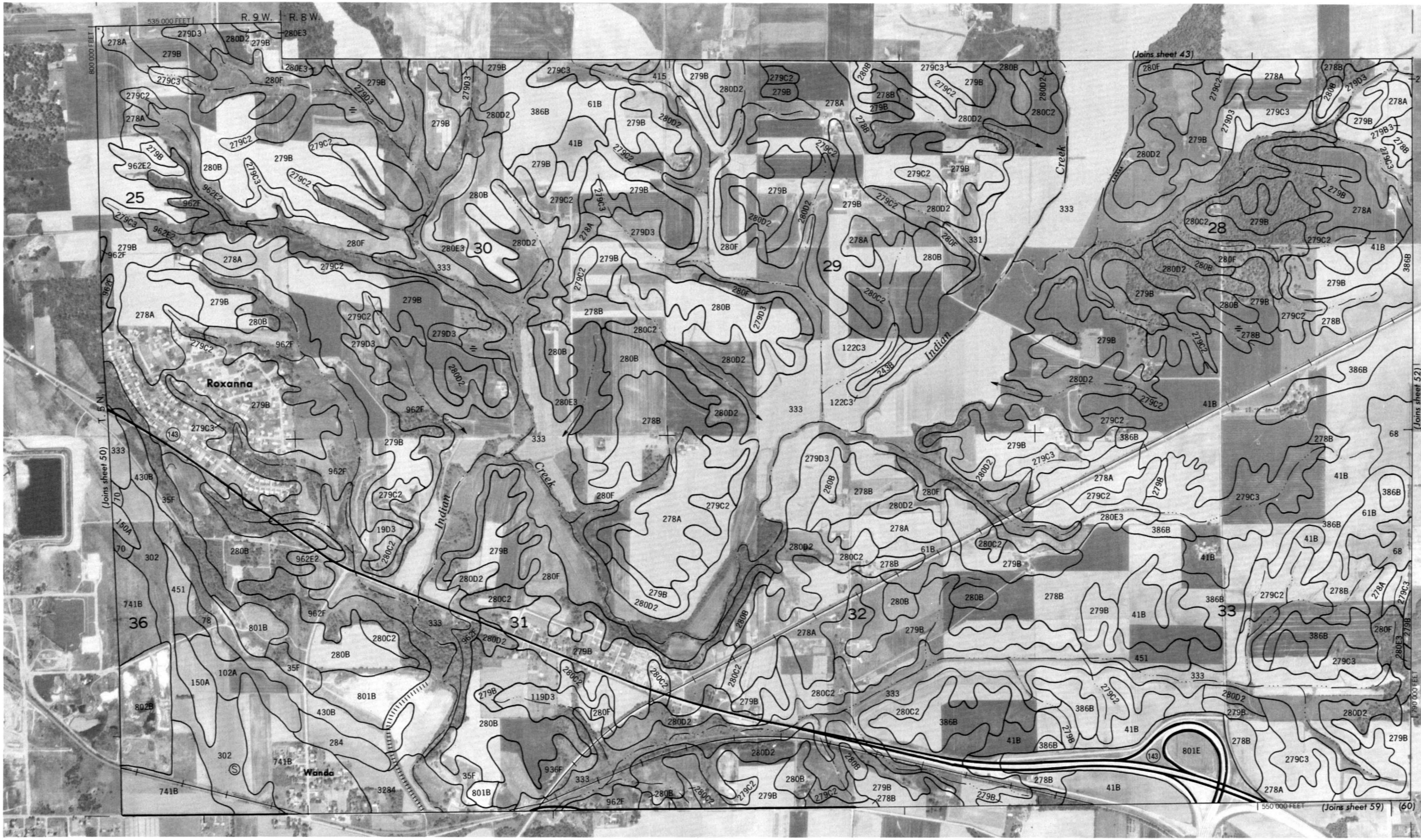
5 000 — 4 000 — 3 000 — 2 000 — 1 000 — 0 — 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

51

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

52

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 54

54

N

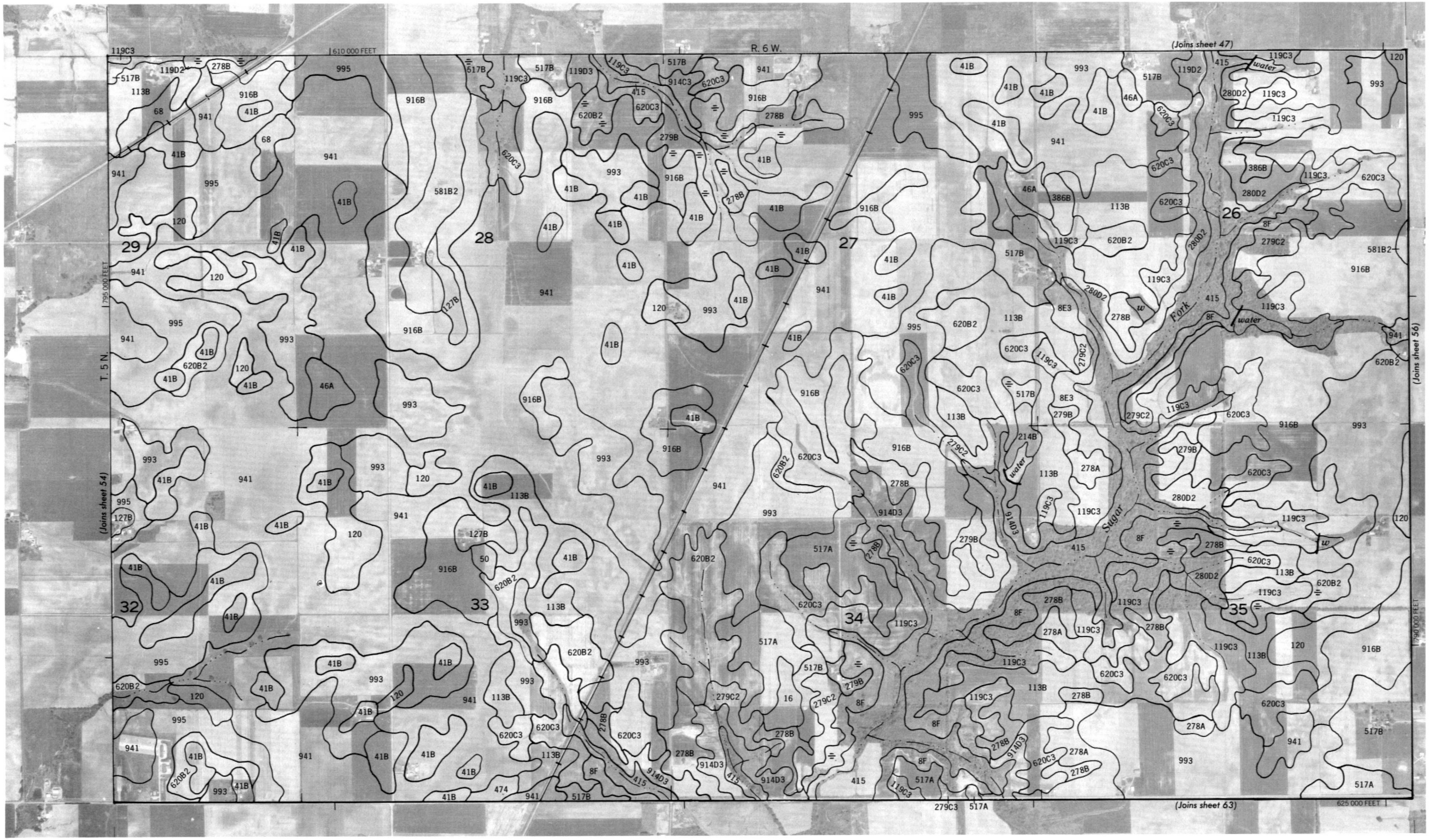
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



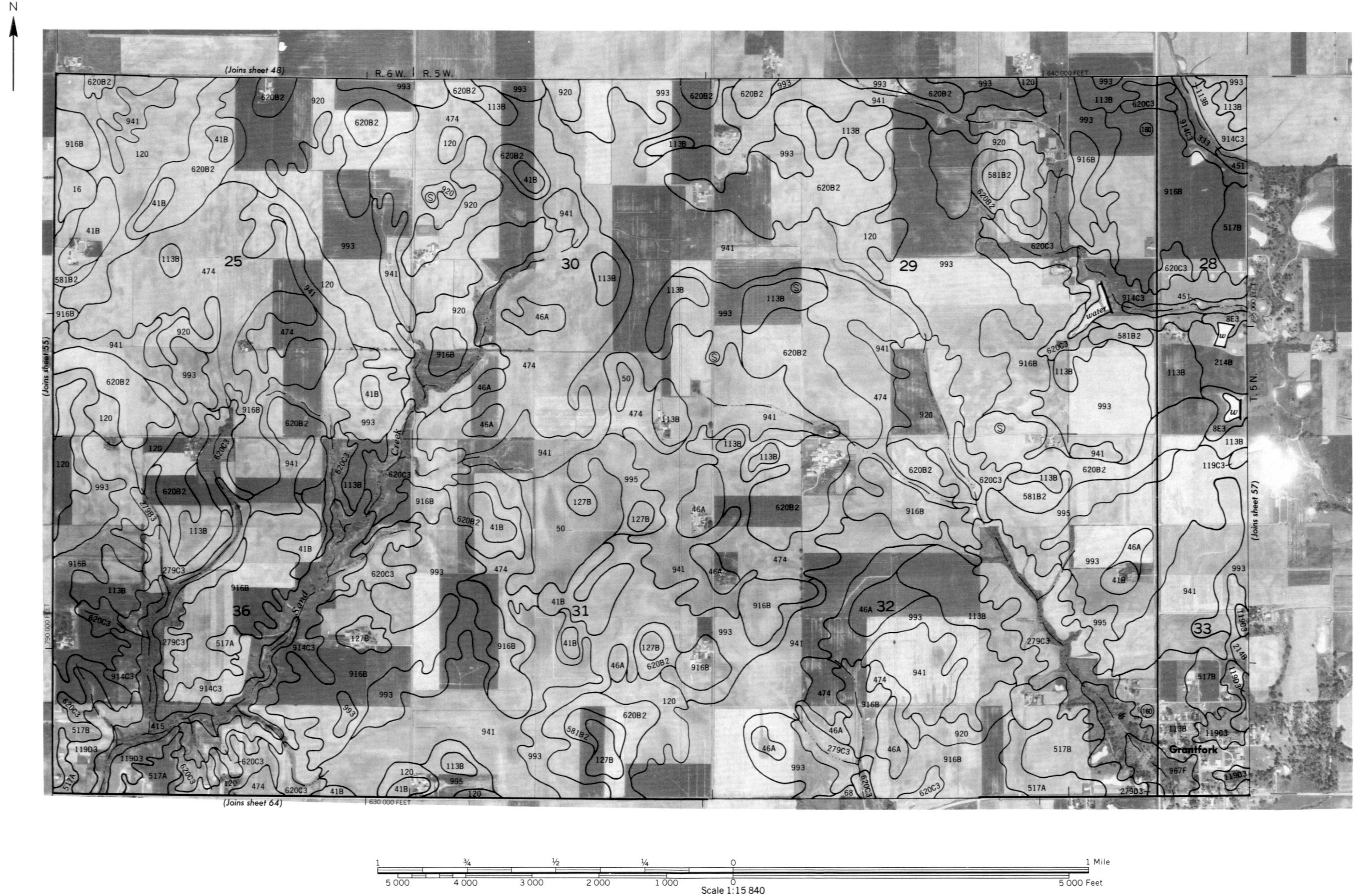
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

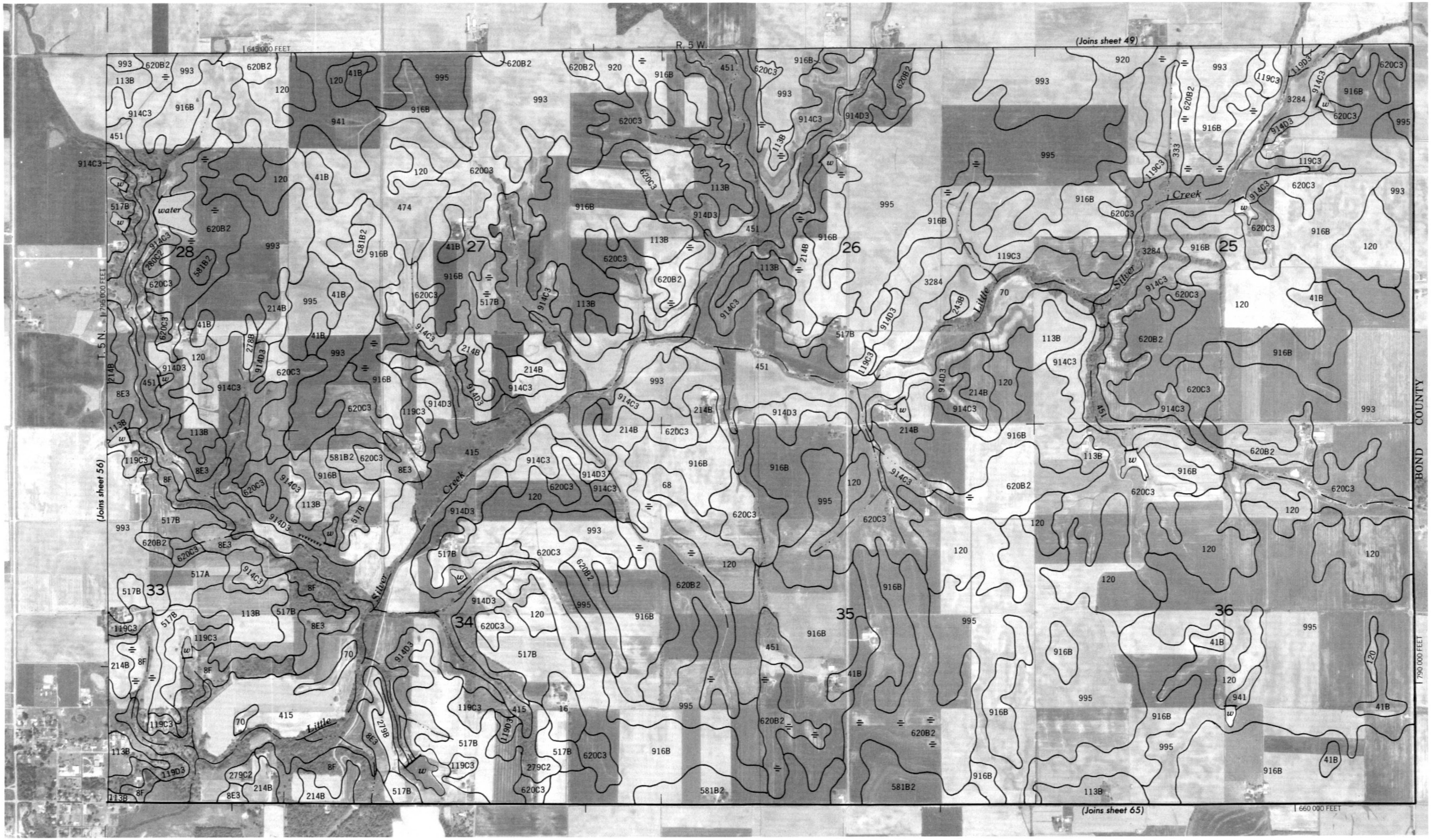
MADISON COUNTY, ILLINOIS — SHEET NUMBER 56



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 58

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

59

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 60

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

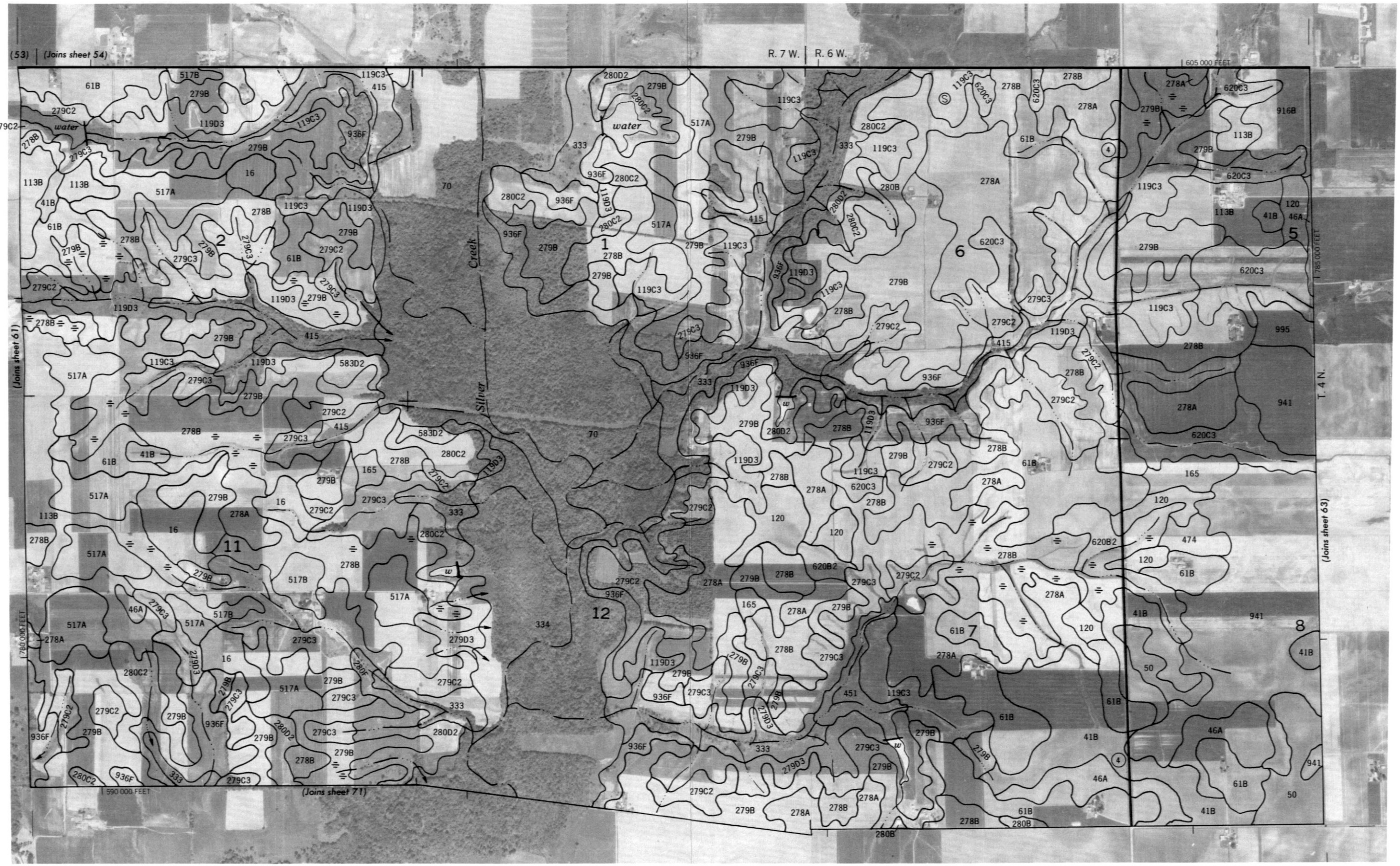
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 62



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

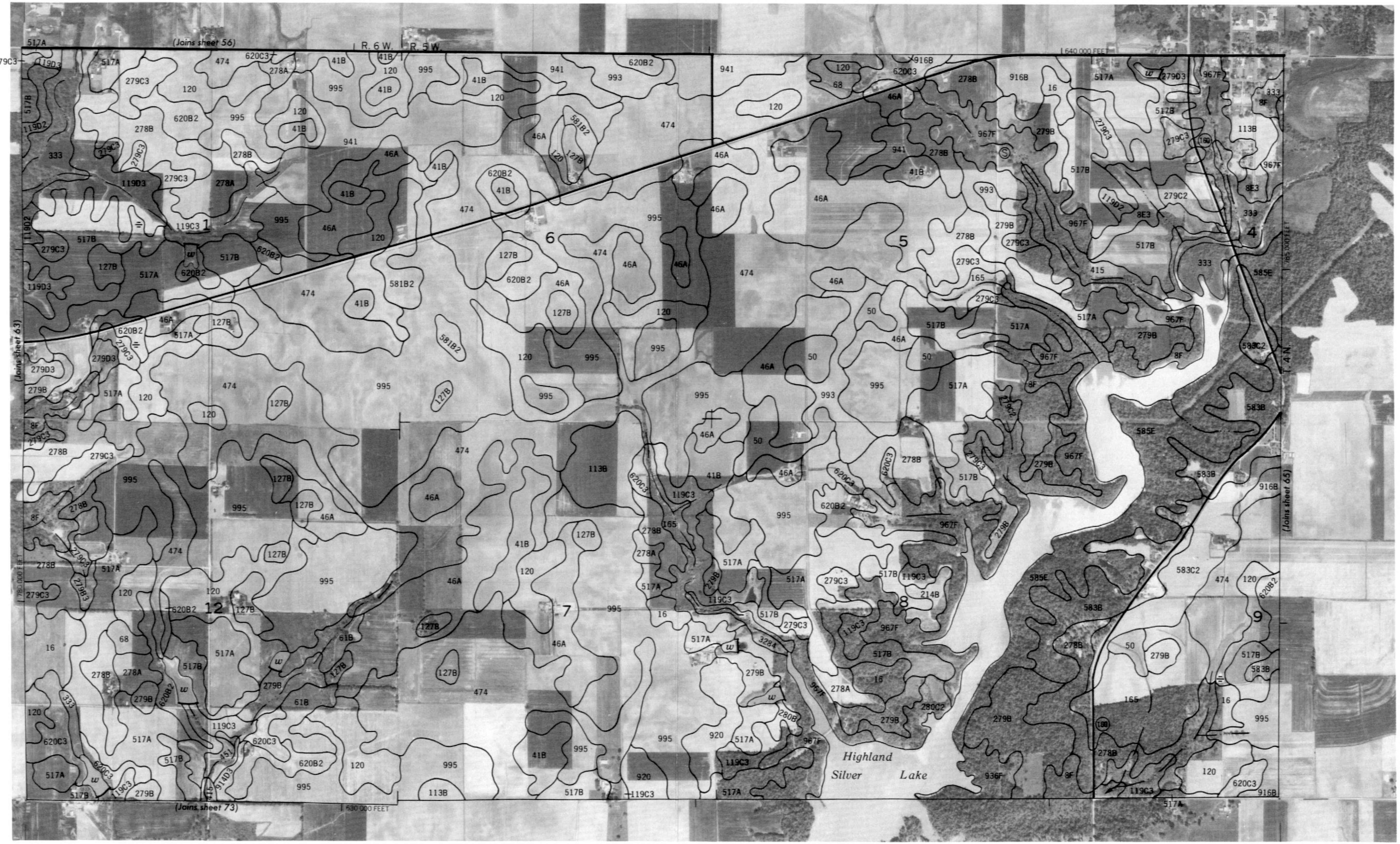
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 64



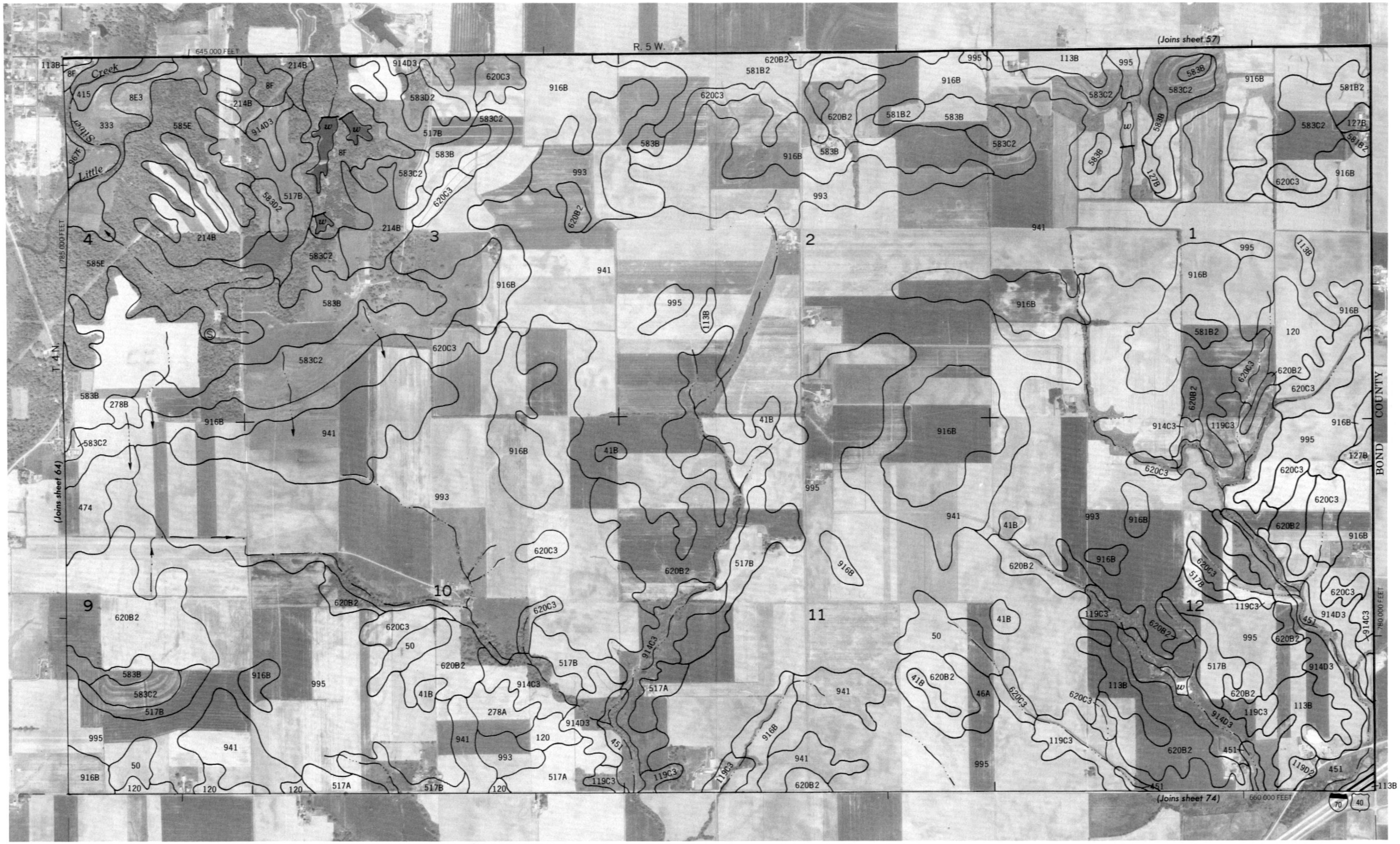
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



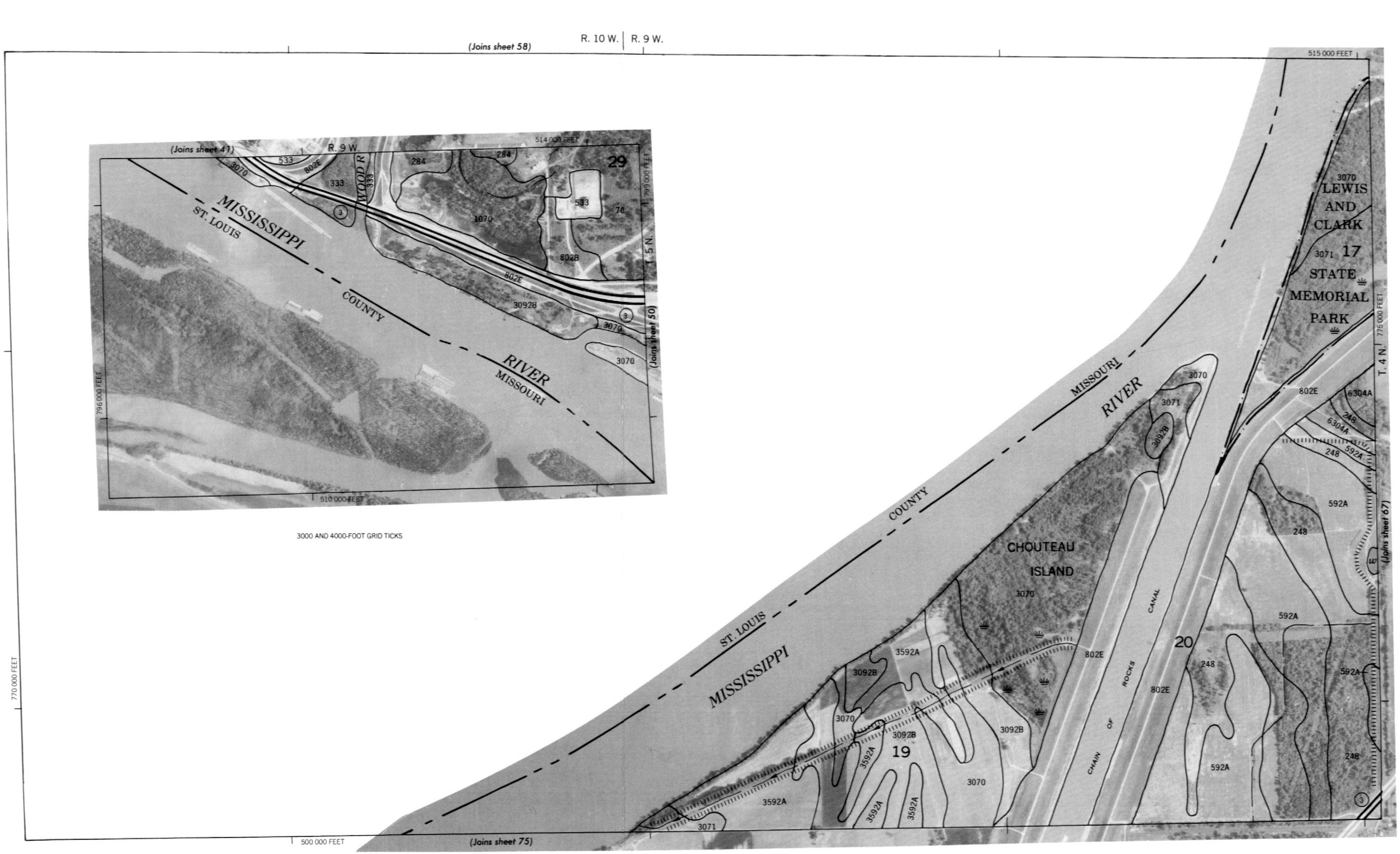
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MADISON COUNTY, ILLINOIS — SHEET NUMBER 66



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N

1 ¾ ½ ¼ 0 1 Mile

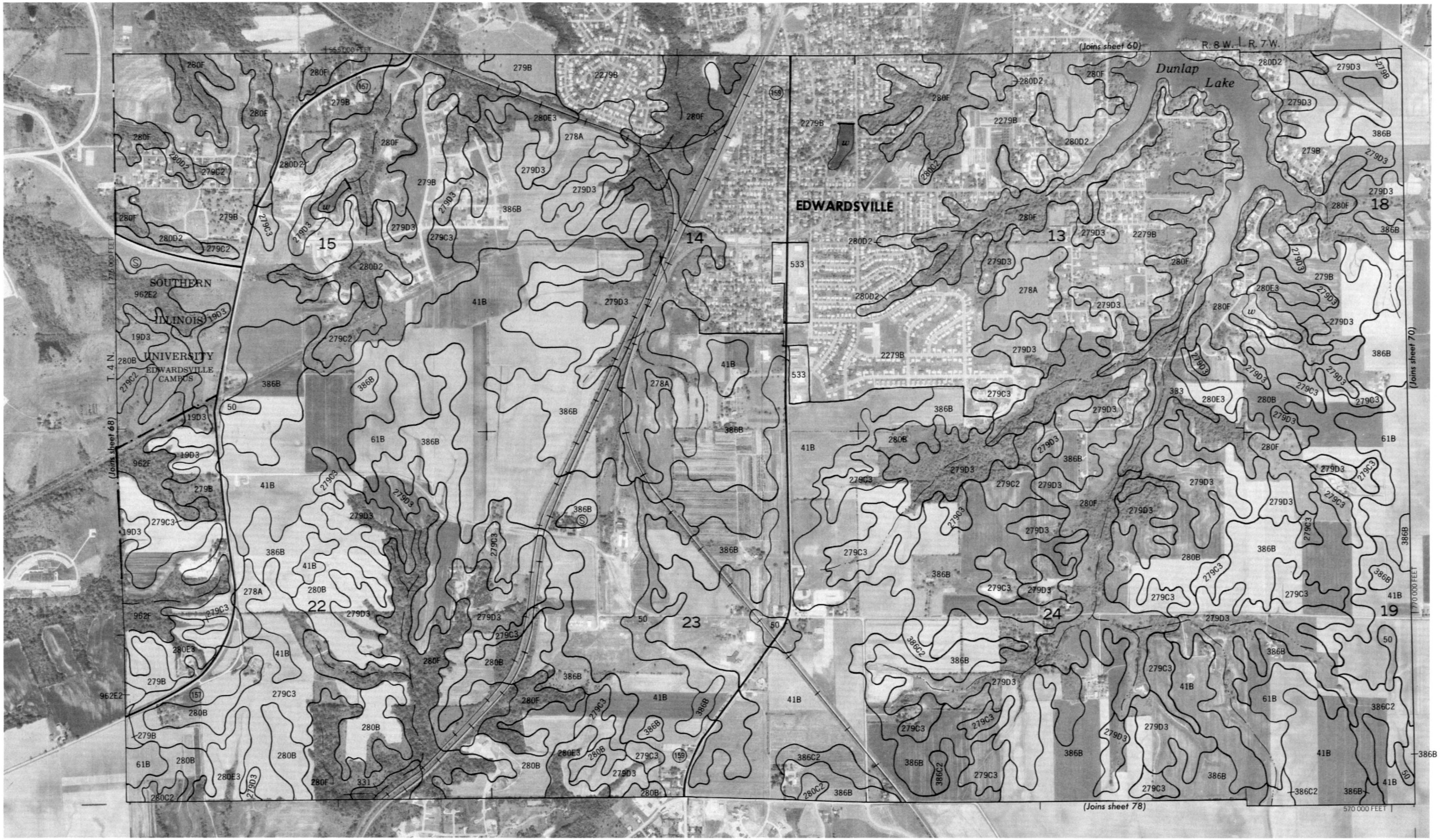
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

69

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

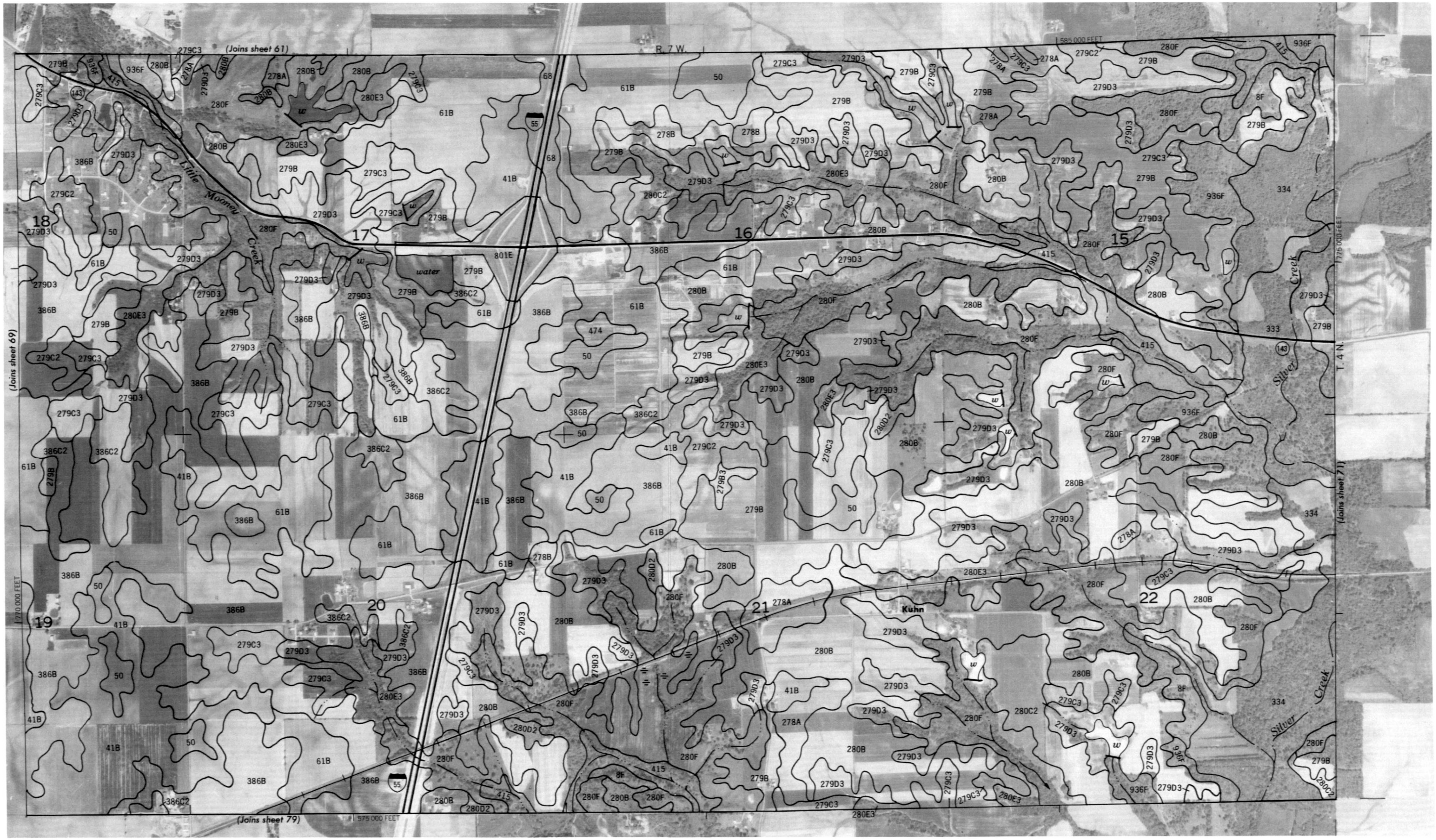
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 70

N



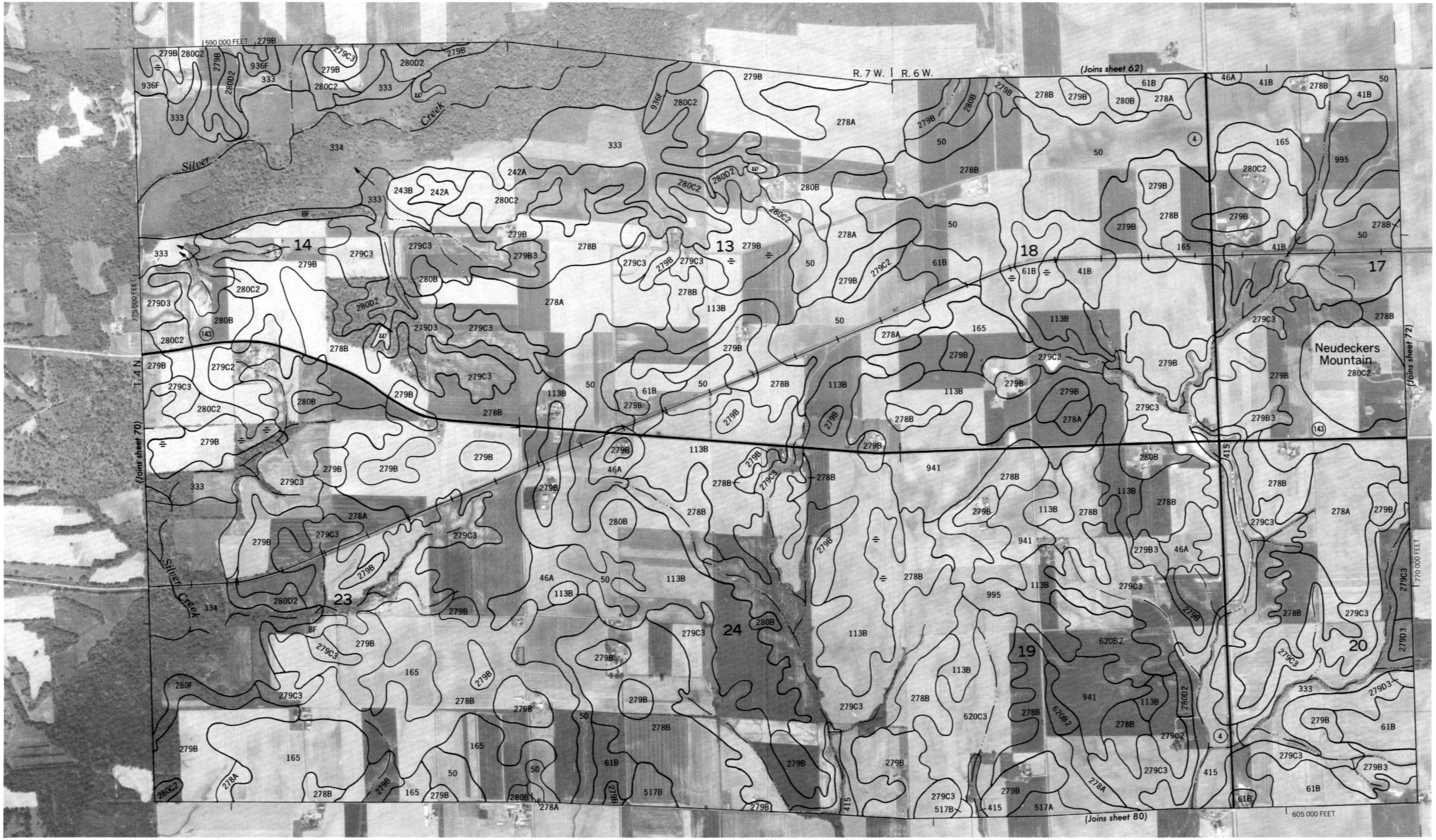
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



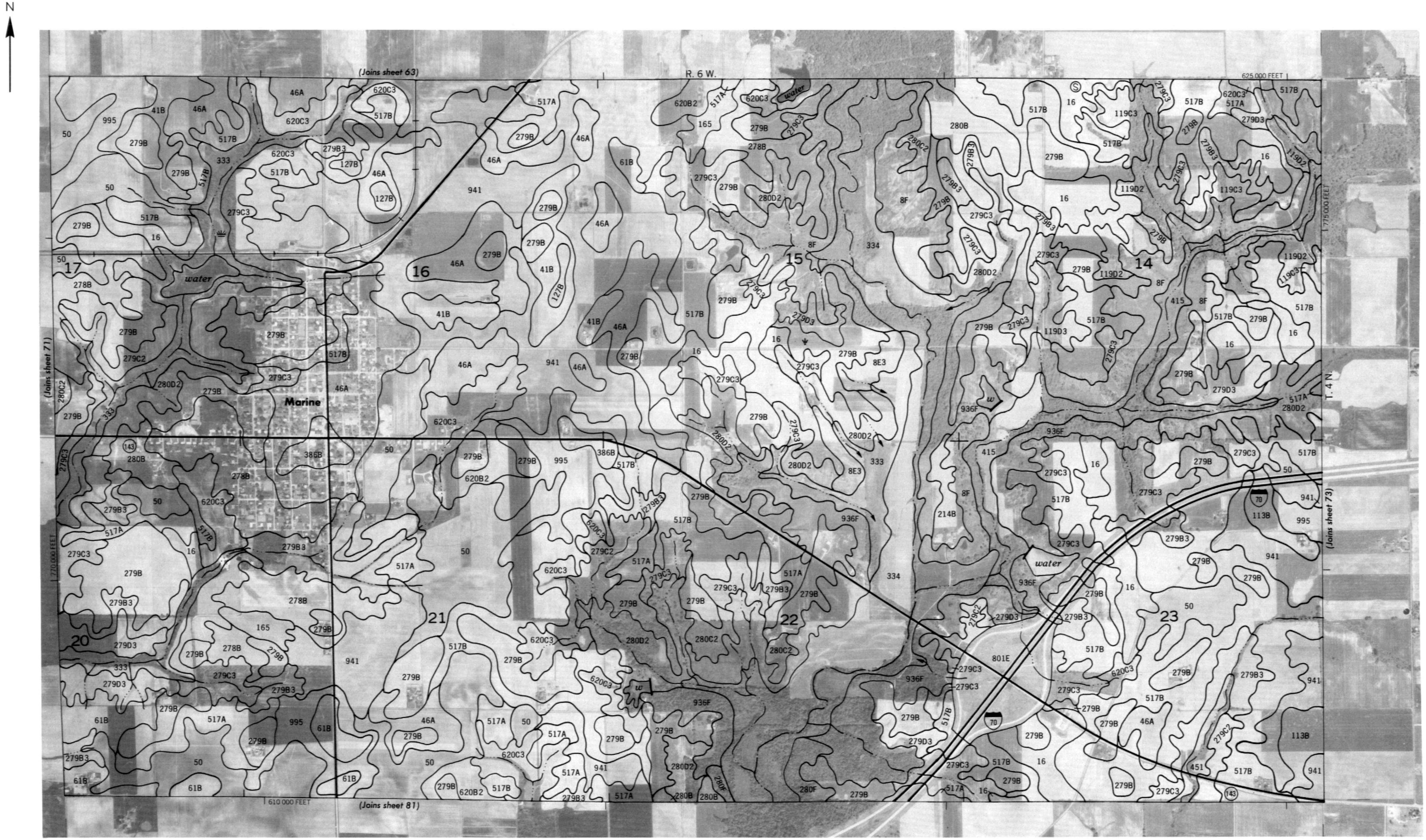
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 72



1	¾	½	¼	0	1 Mile
5 000	4 000	3 000	2 000	1 000	0	5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 74

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

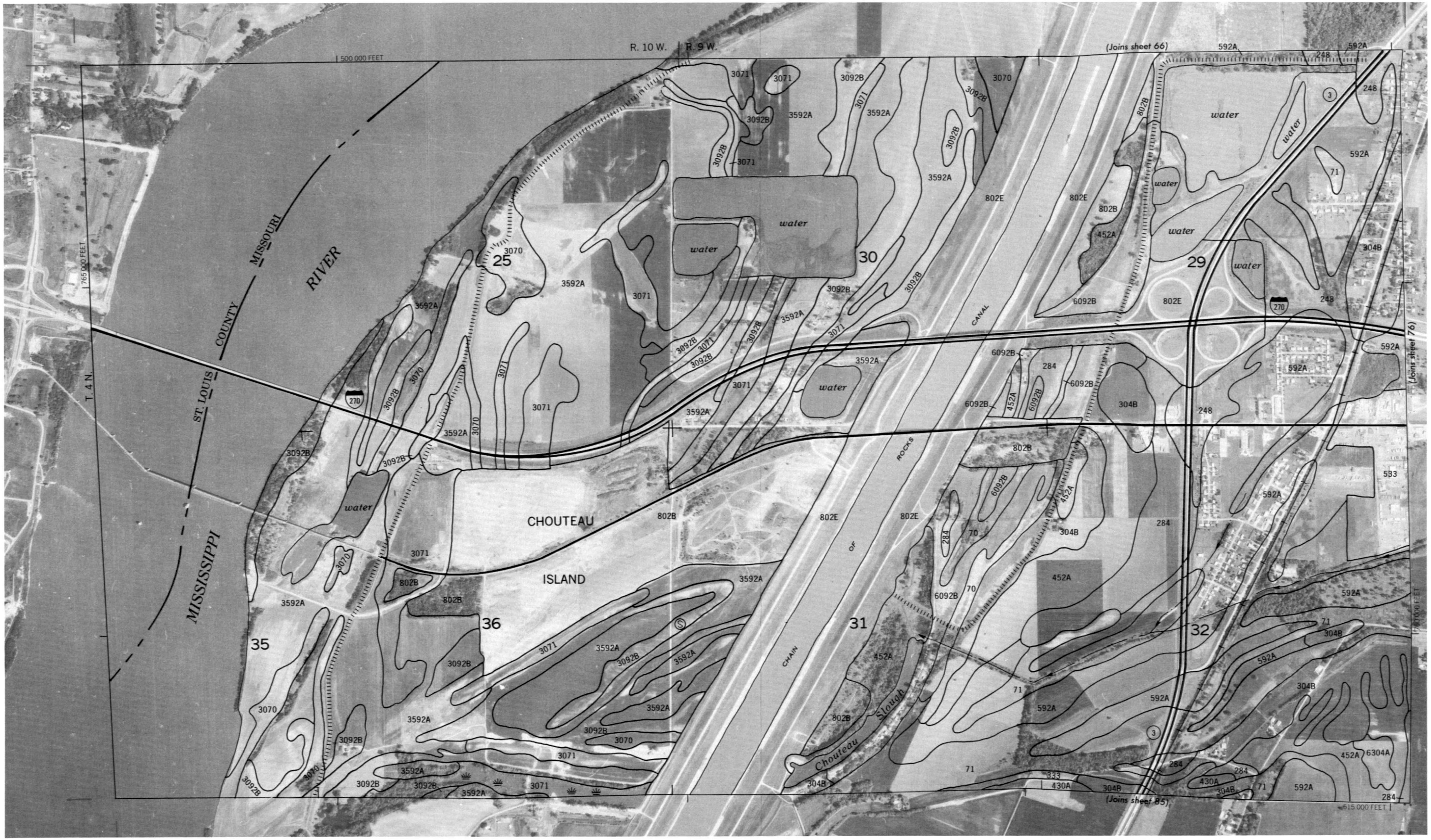
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

75

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 76

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

77

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

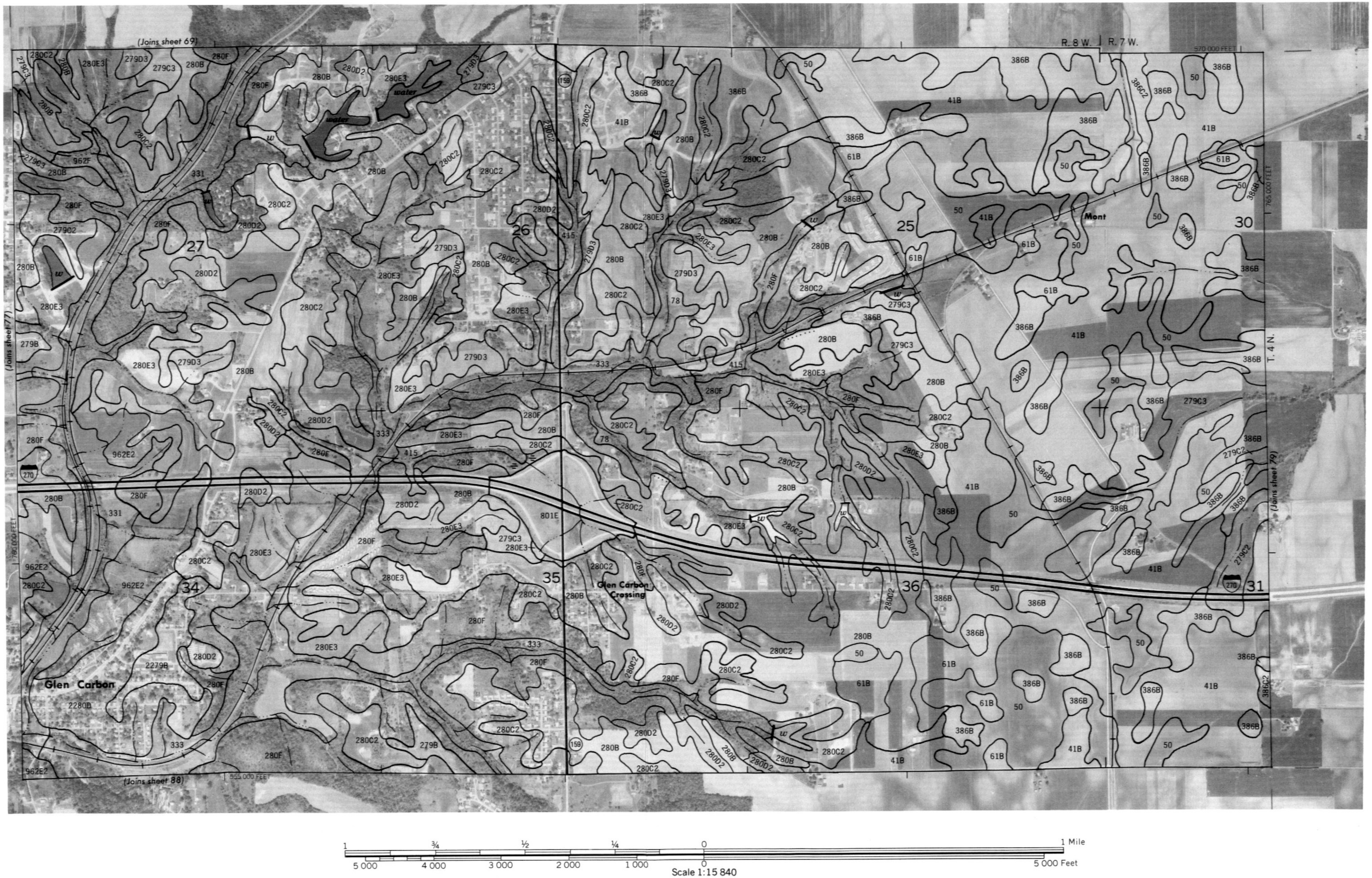
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

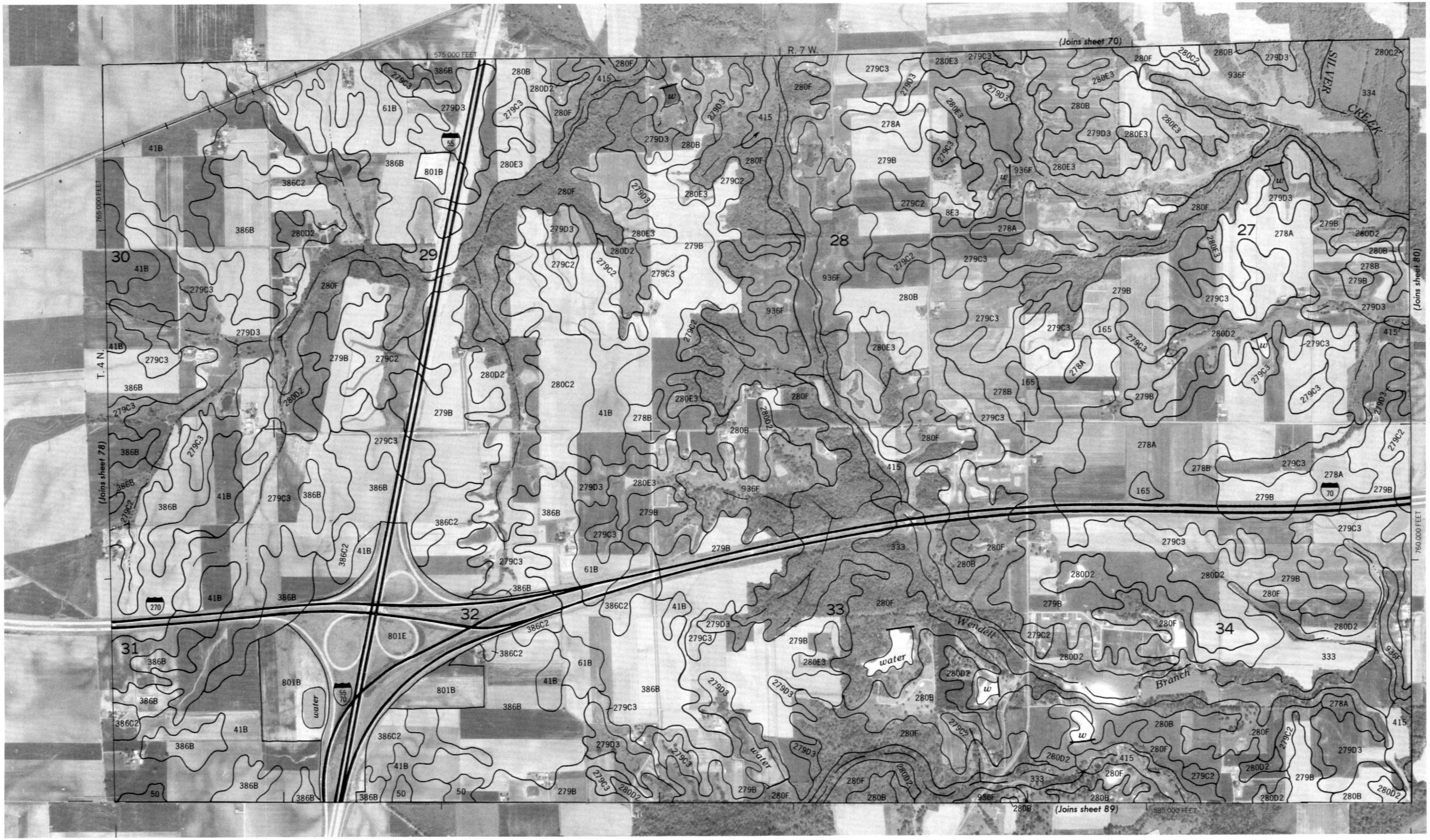
78

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

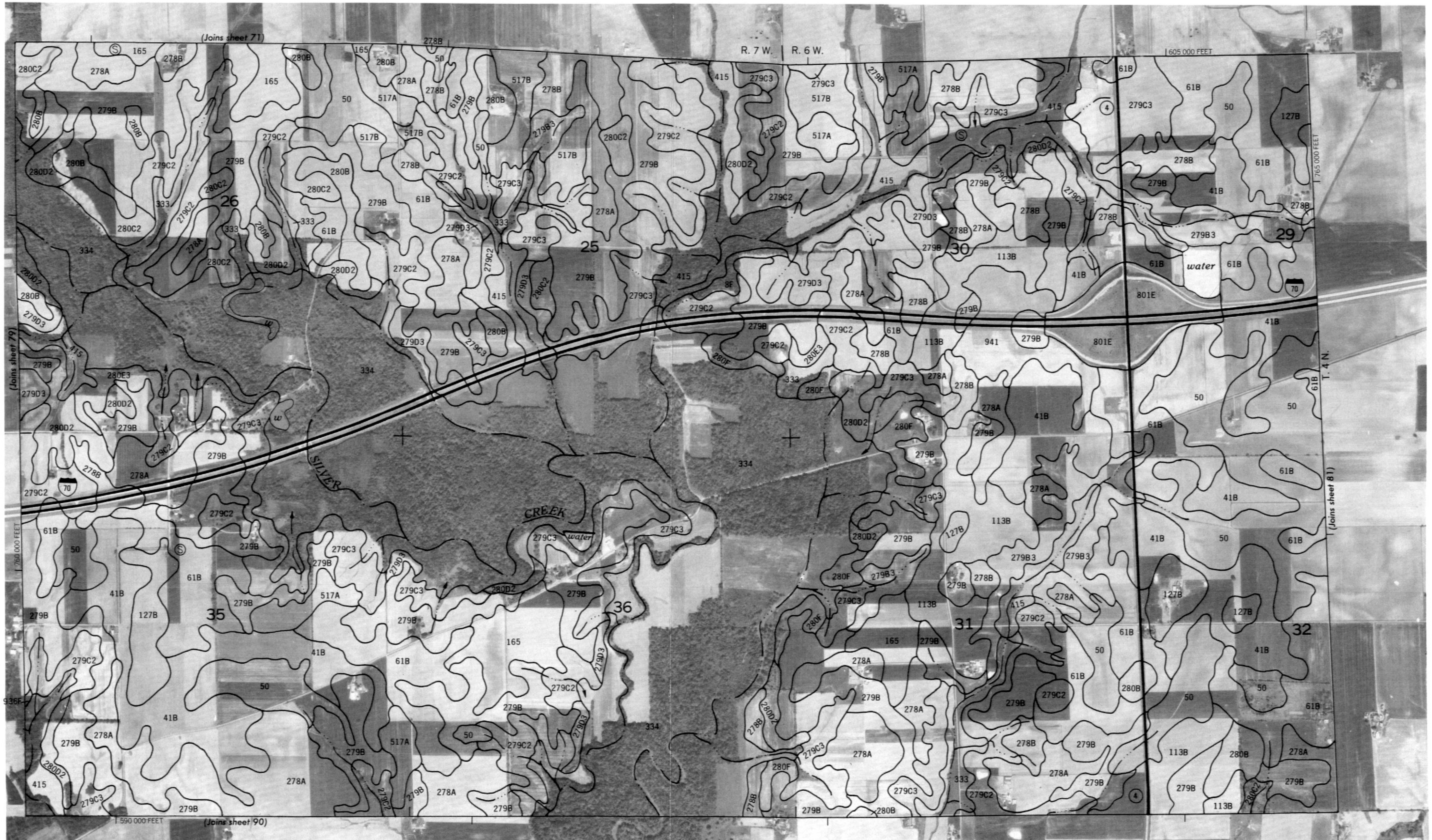
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 80

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

81

N

1 ¾ ½ ¼ 0 1 Mile

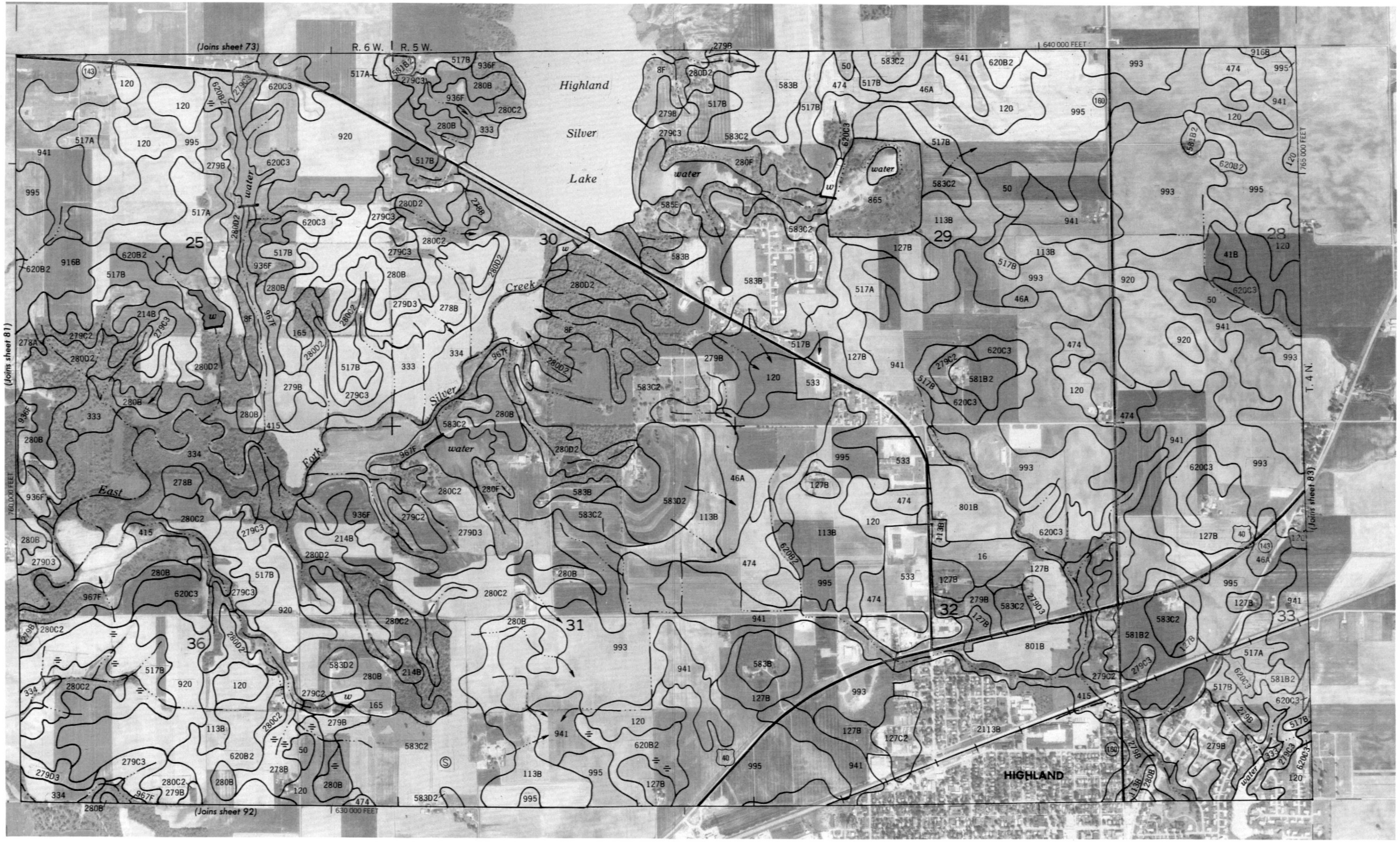
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 82



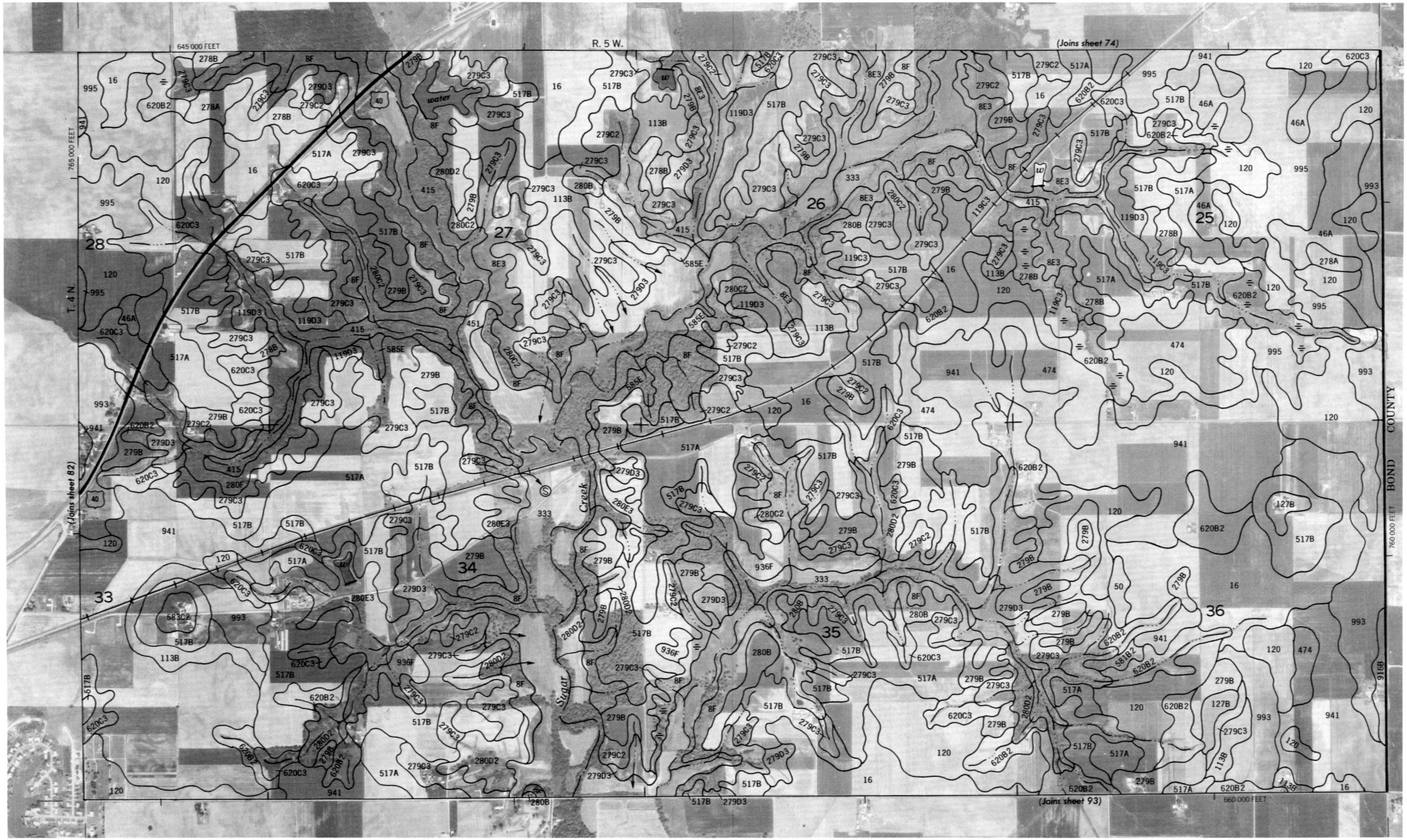
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

84

N

1 ¾ ½ ¼ 0 1 Mile

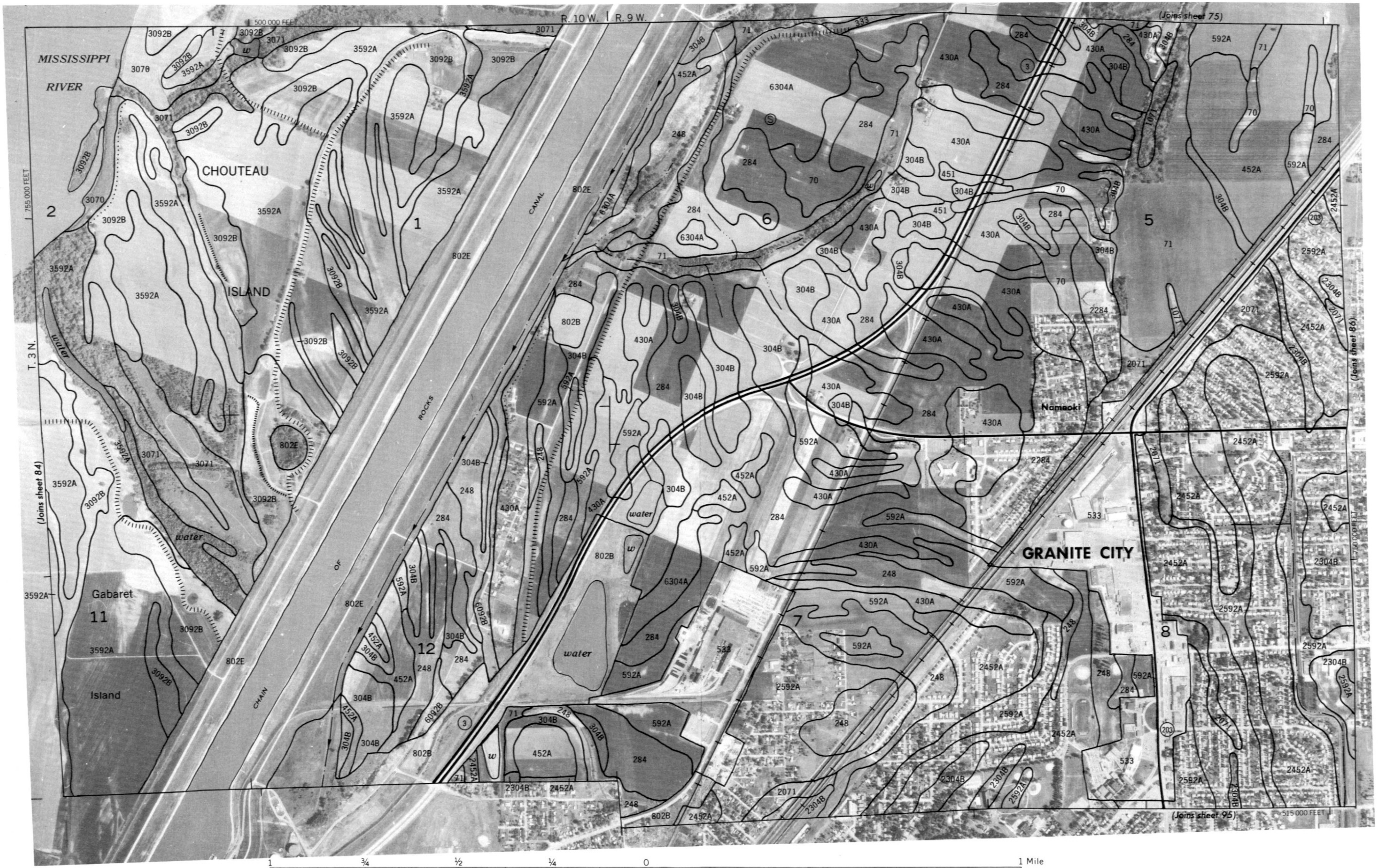
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

85

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

86

N

MADISON COUNTY, ILLINOIS — SHEET NUMBER 86

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

87

N

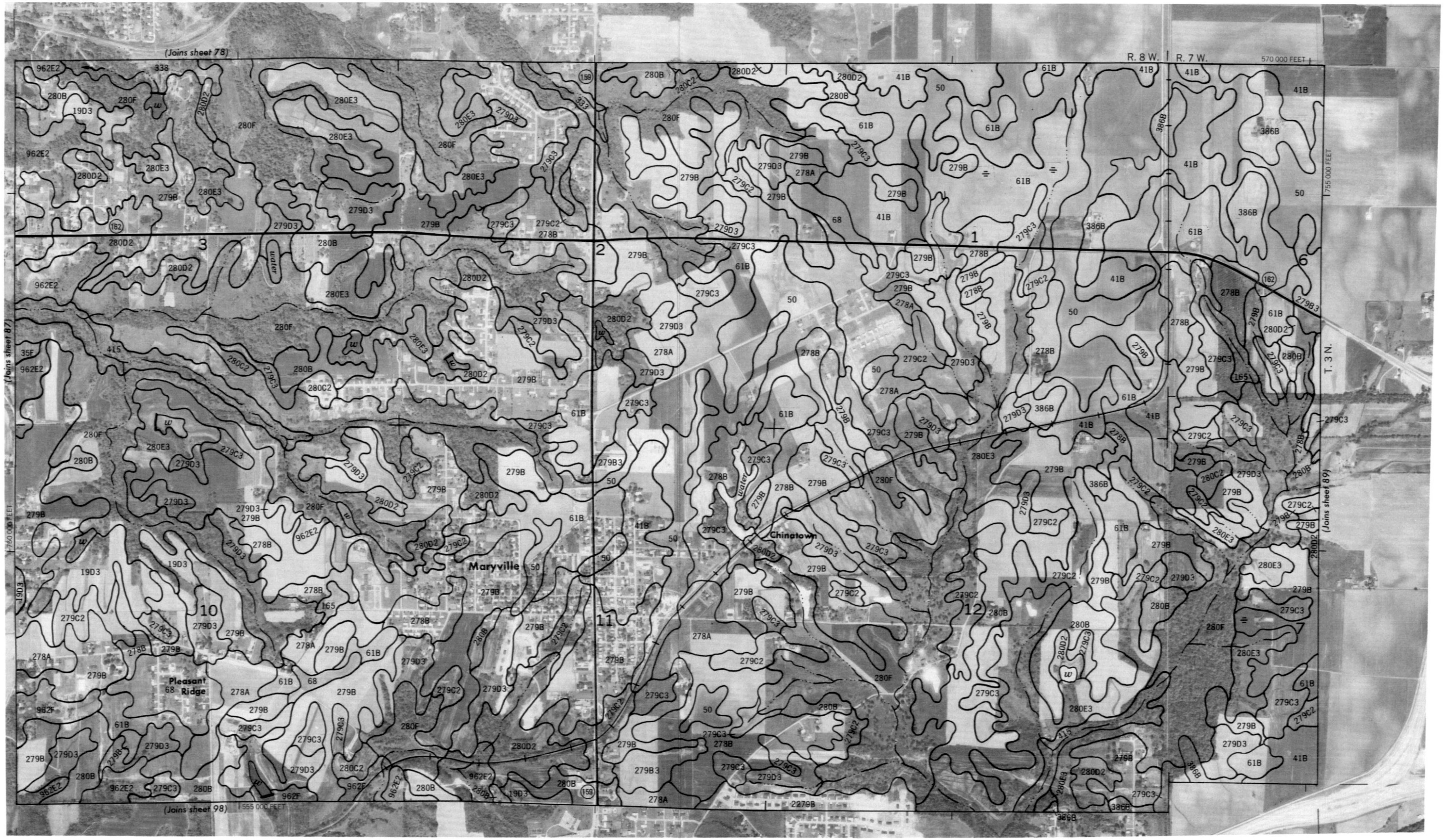
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MADISON COUNTY, ILLINOIS — SHEET NUMBER 90

N

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 | ¾ | ½ | ¼ | 0 | 1 Mile

5 000 | 4 000 | 3 000 | 2 000 | 1 000 | 0 | 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 92

N

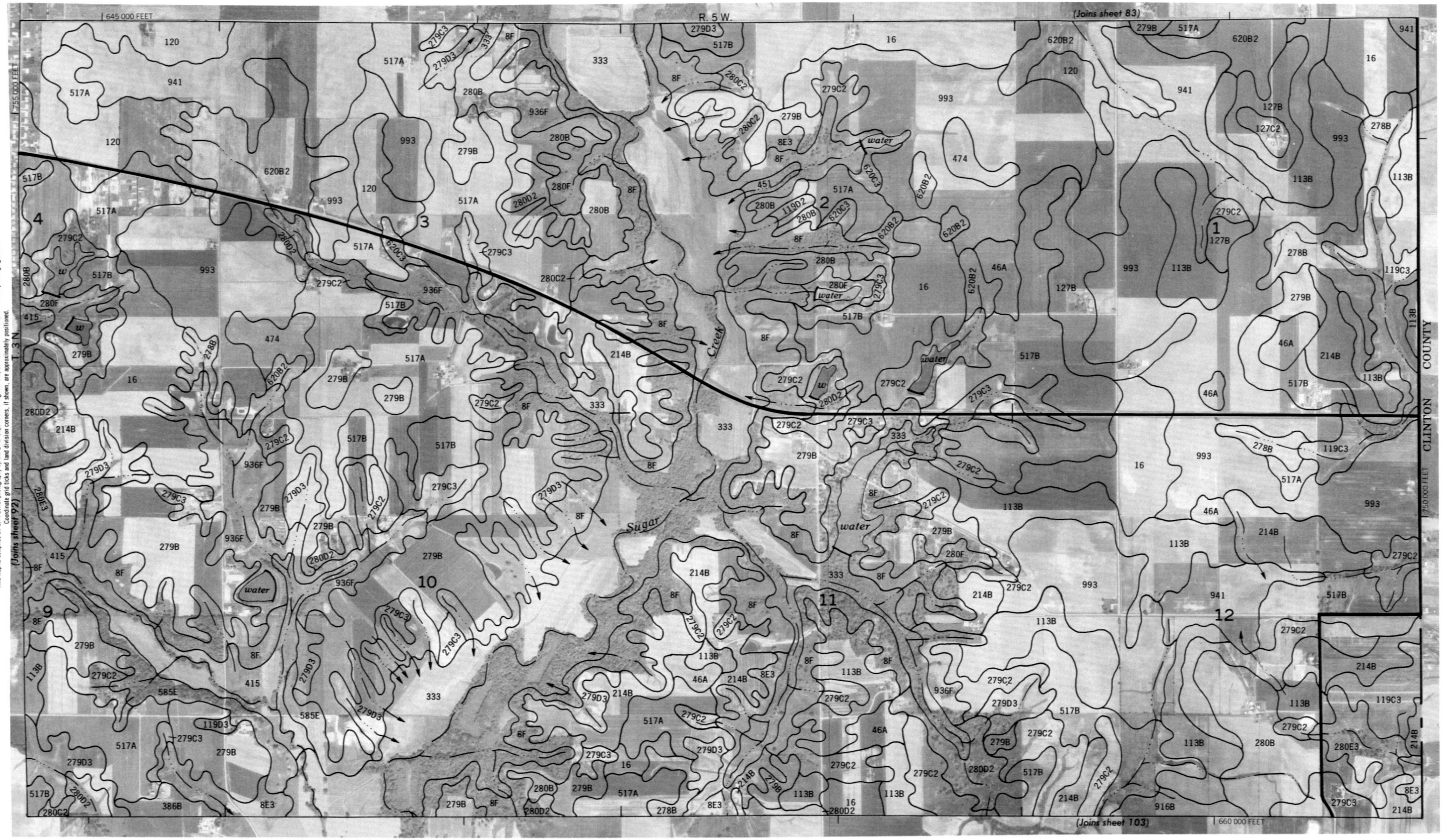
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



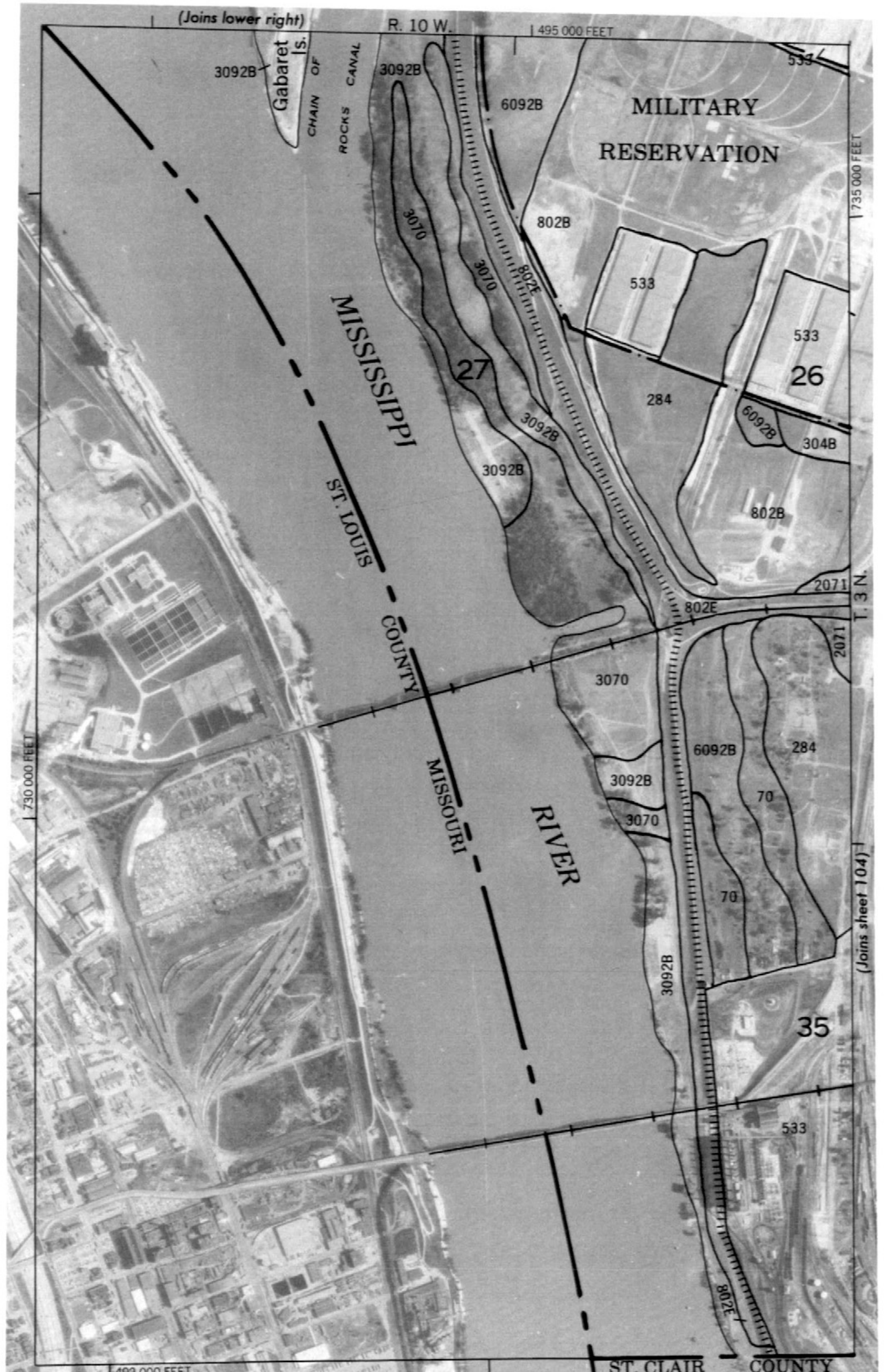
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

94

N



3000 AND 5000-FOOT GRID TICKS

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

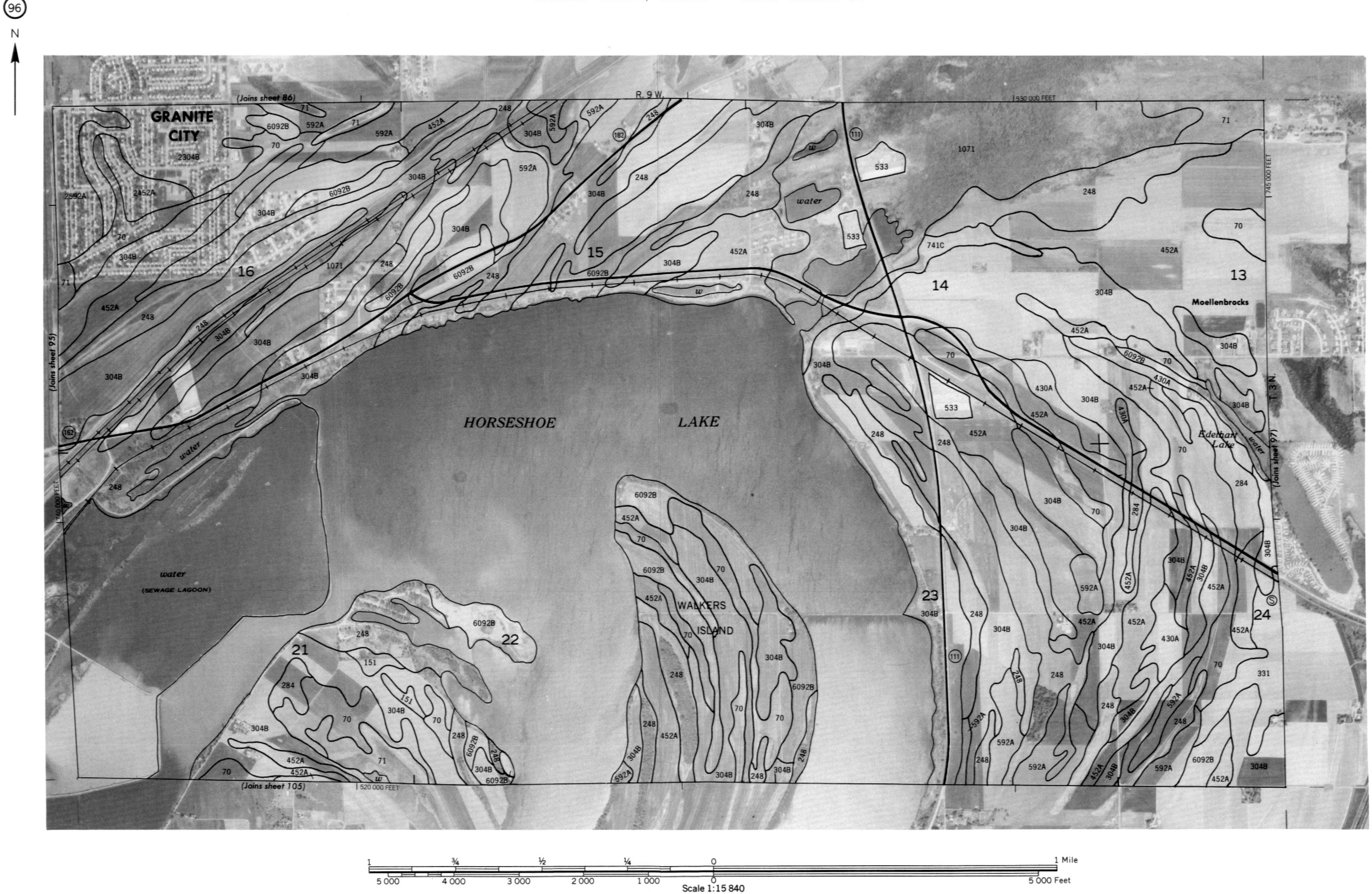
N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

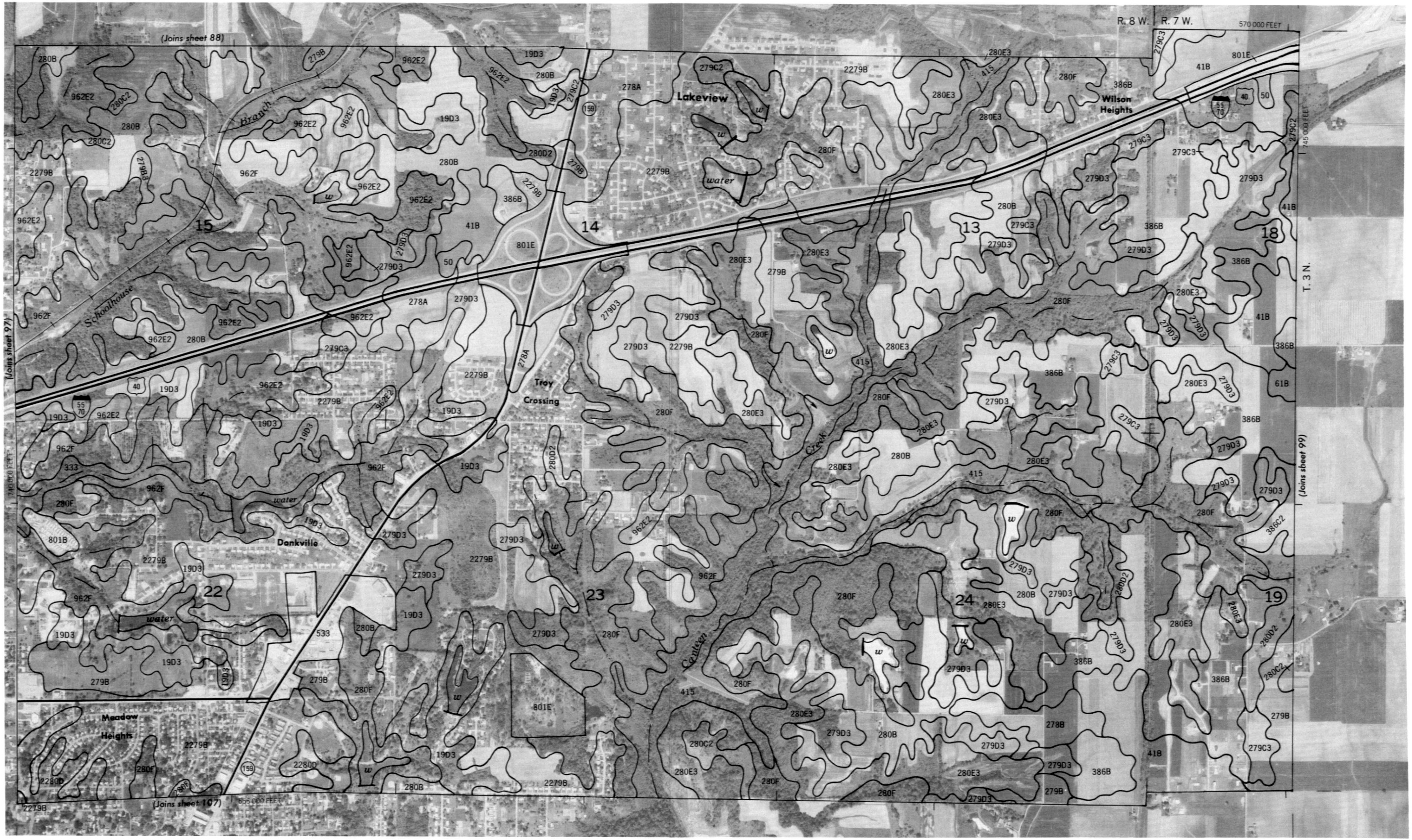
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 98

N



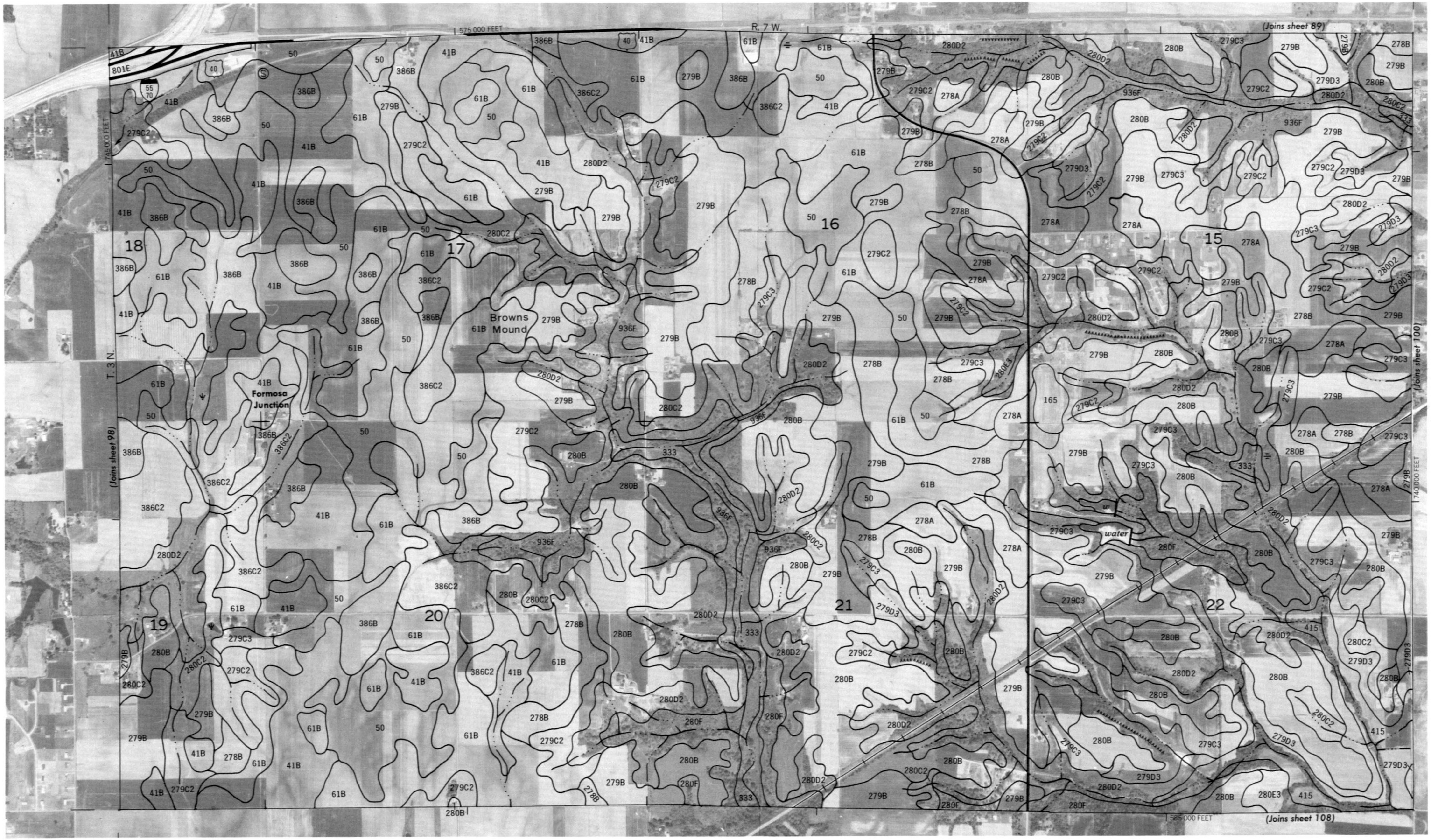
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

(100)

N

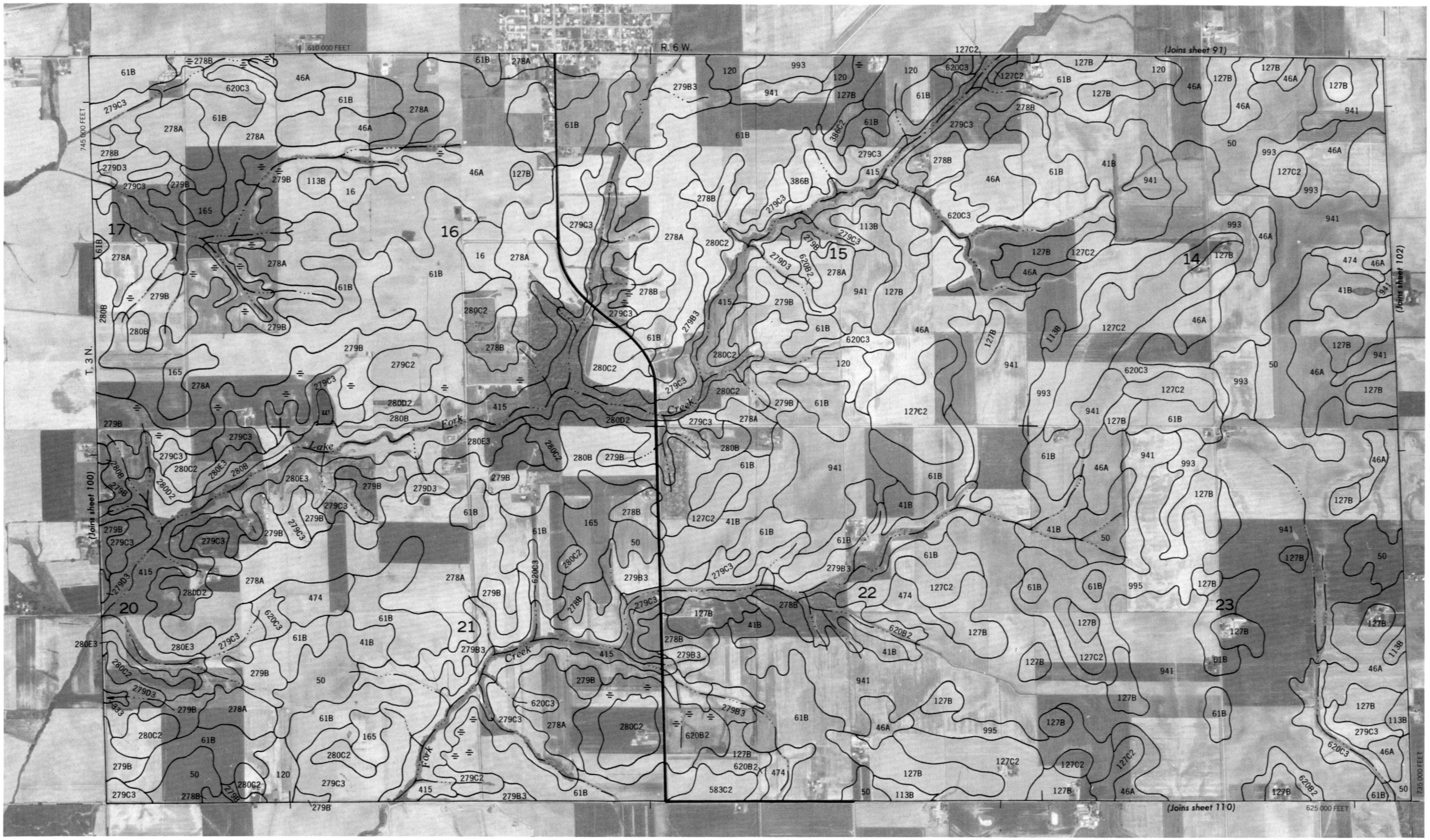
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

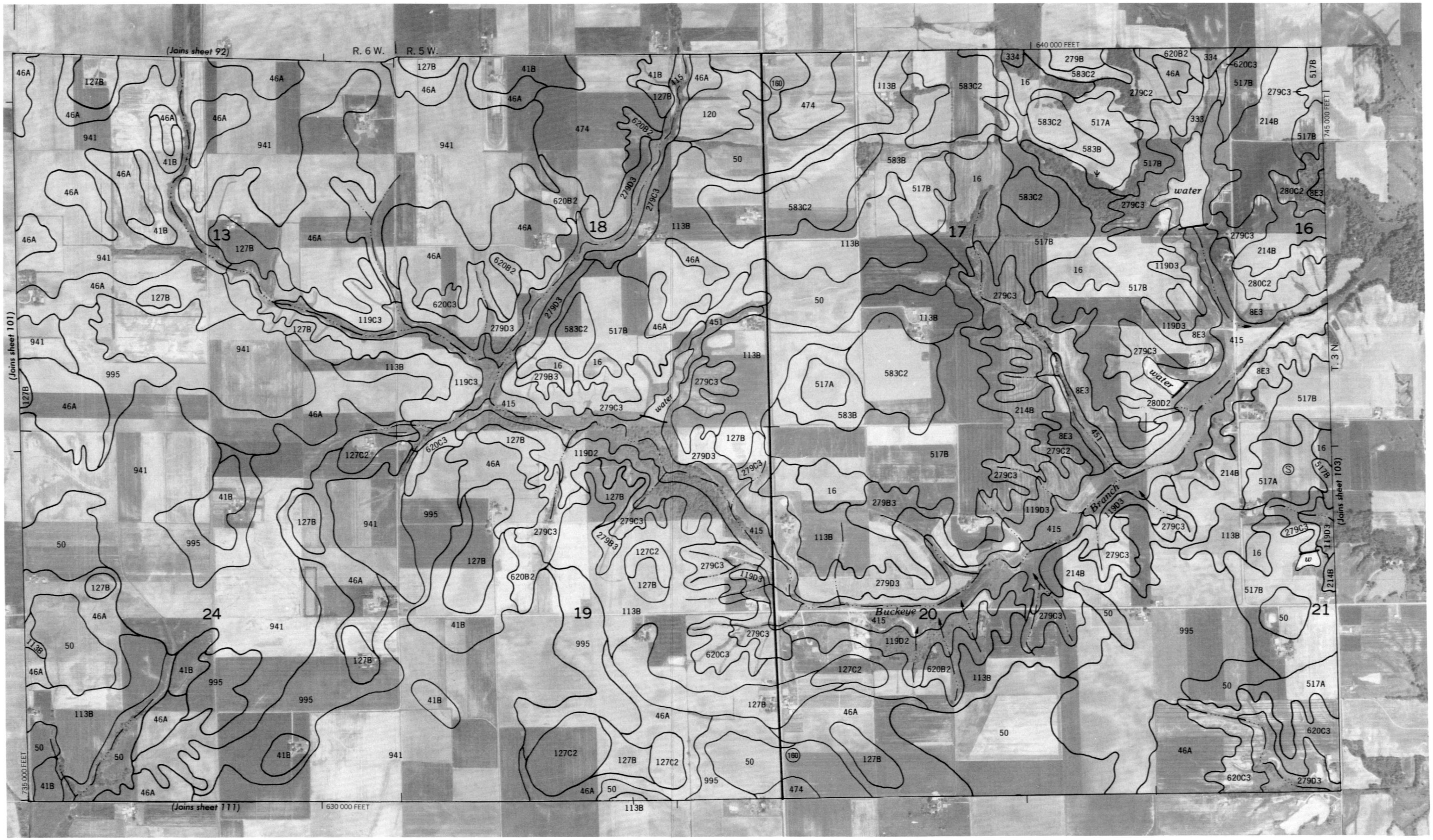
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 102

N



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

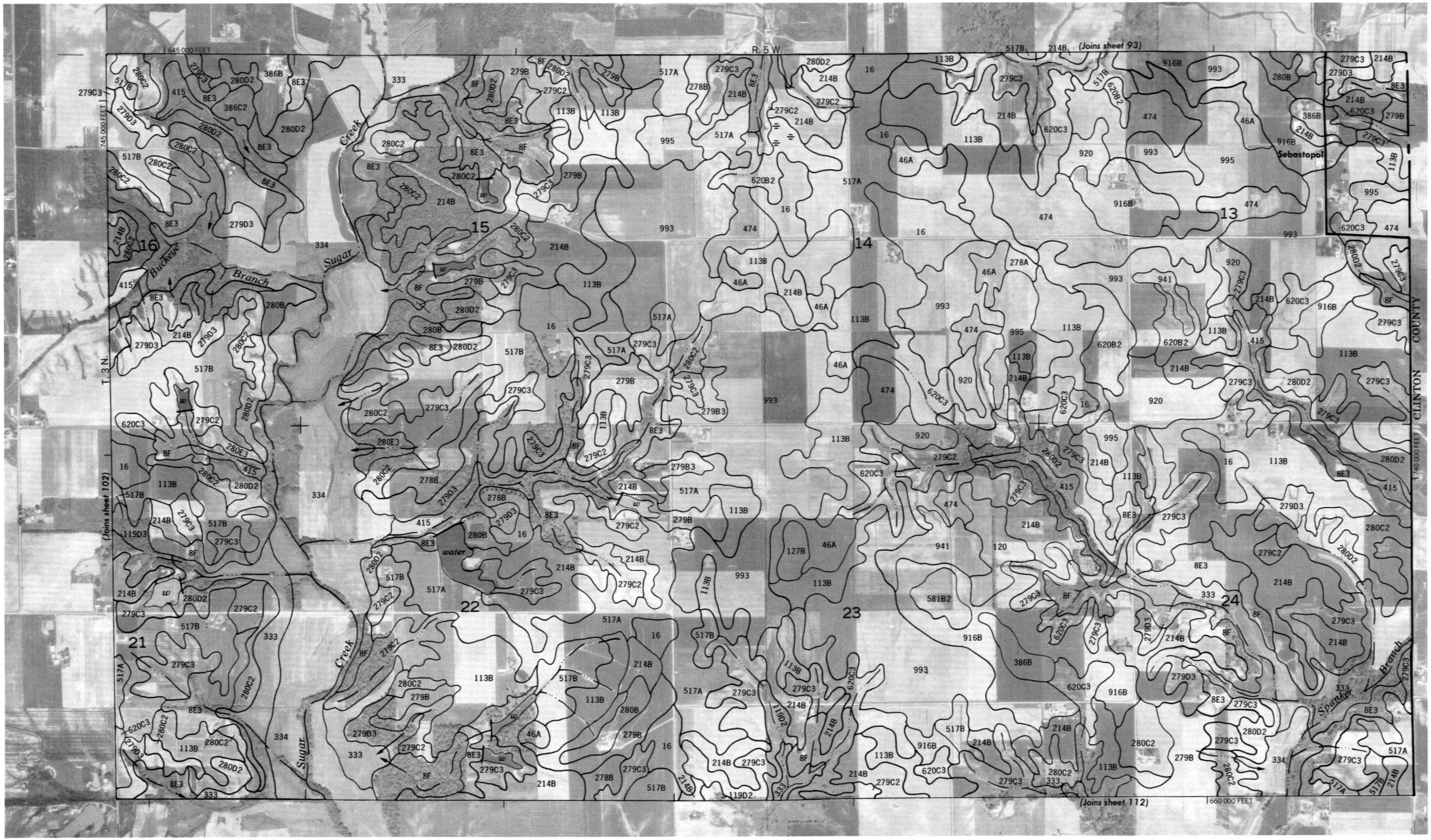
Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

103

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

MADISON COUNTY, ILLINOIS — SHEET NUMBER 104

N

1 ¾ ½ ¼ 0 1 Mile

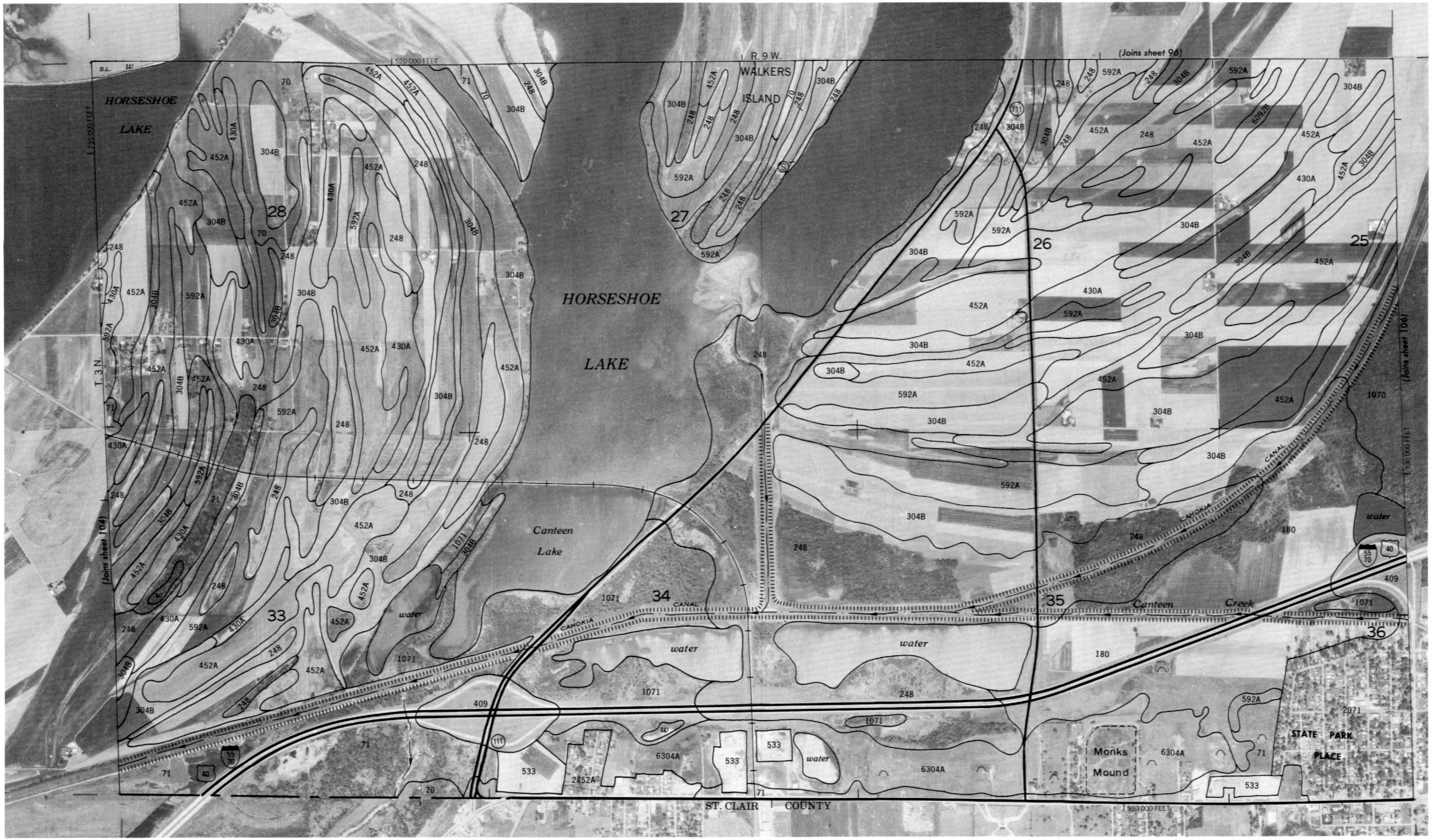
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



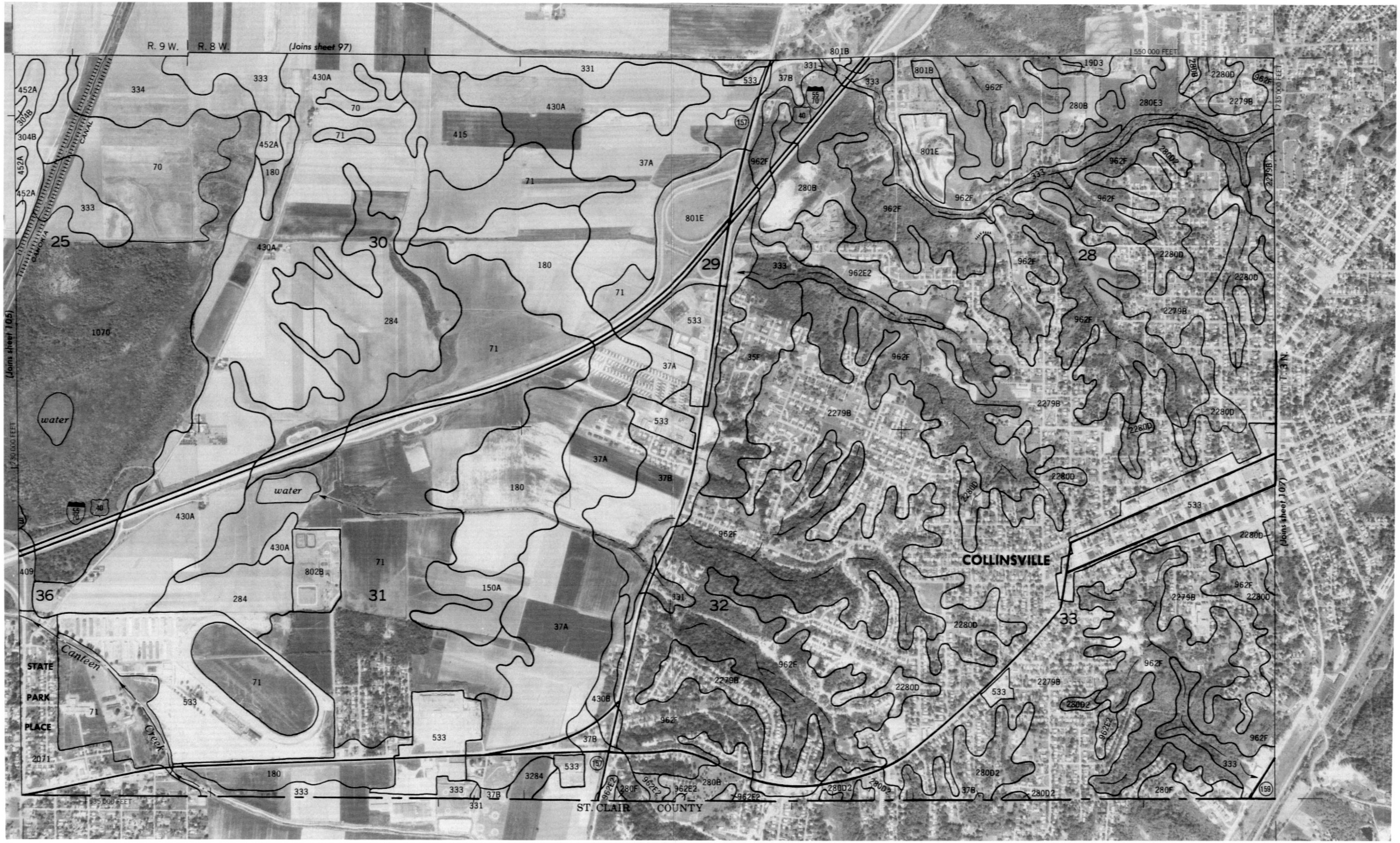
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

106

N



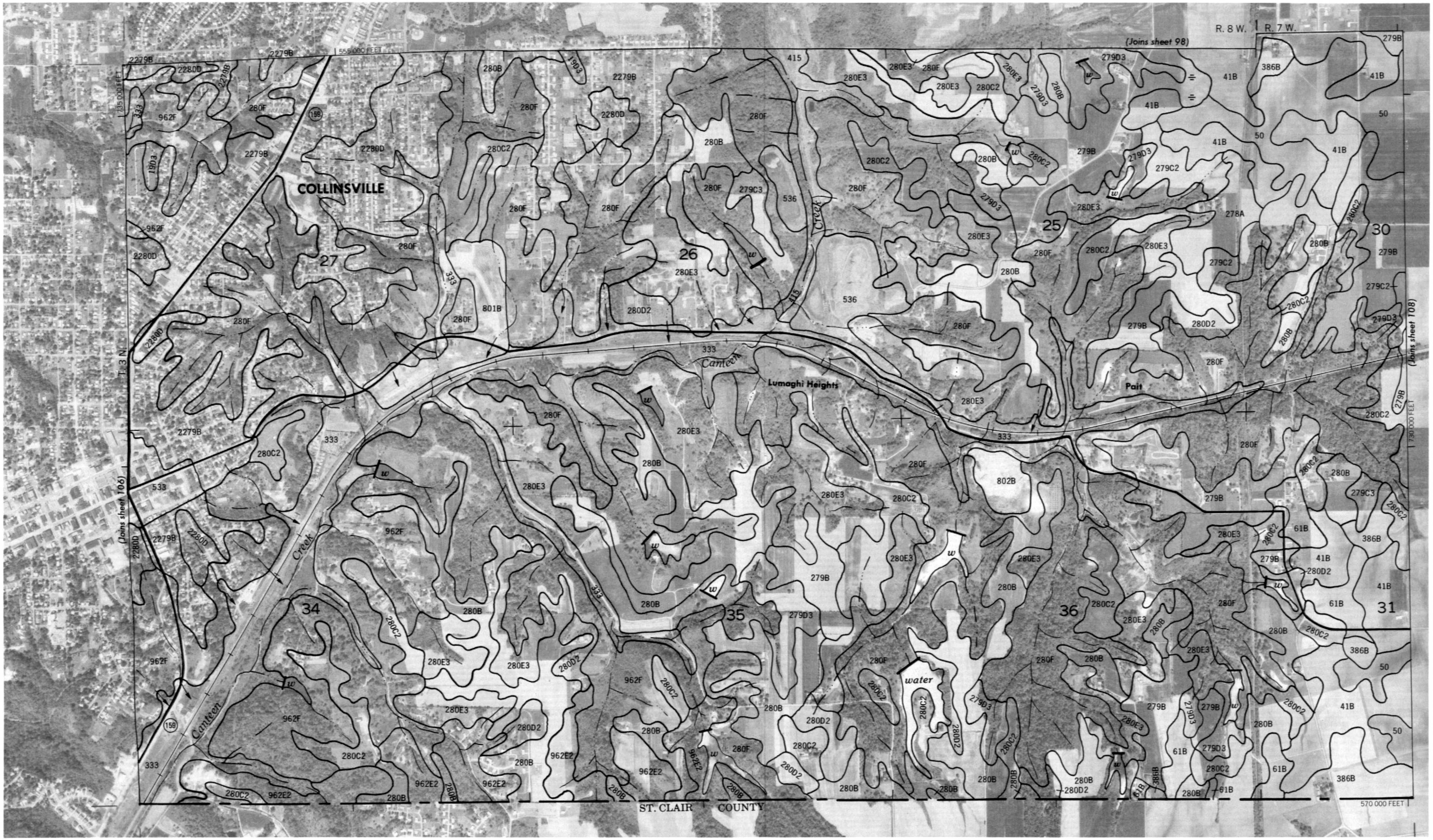
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



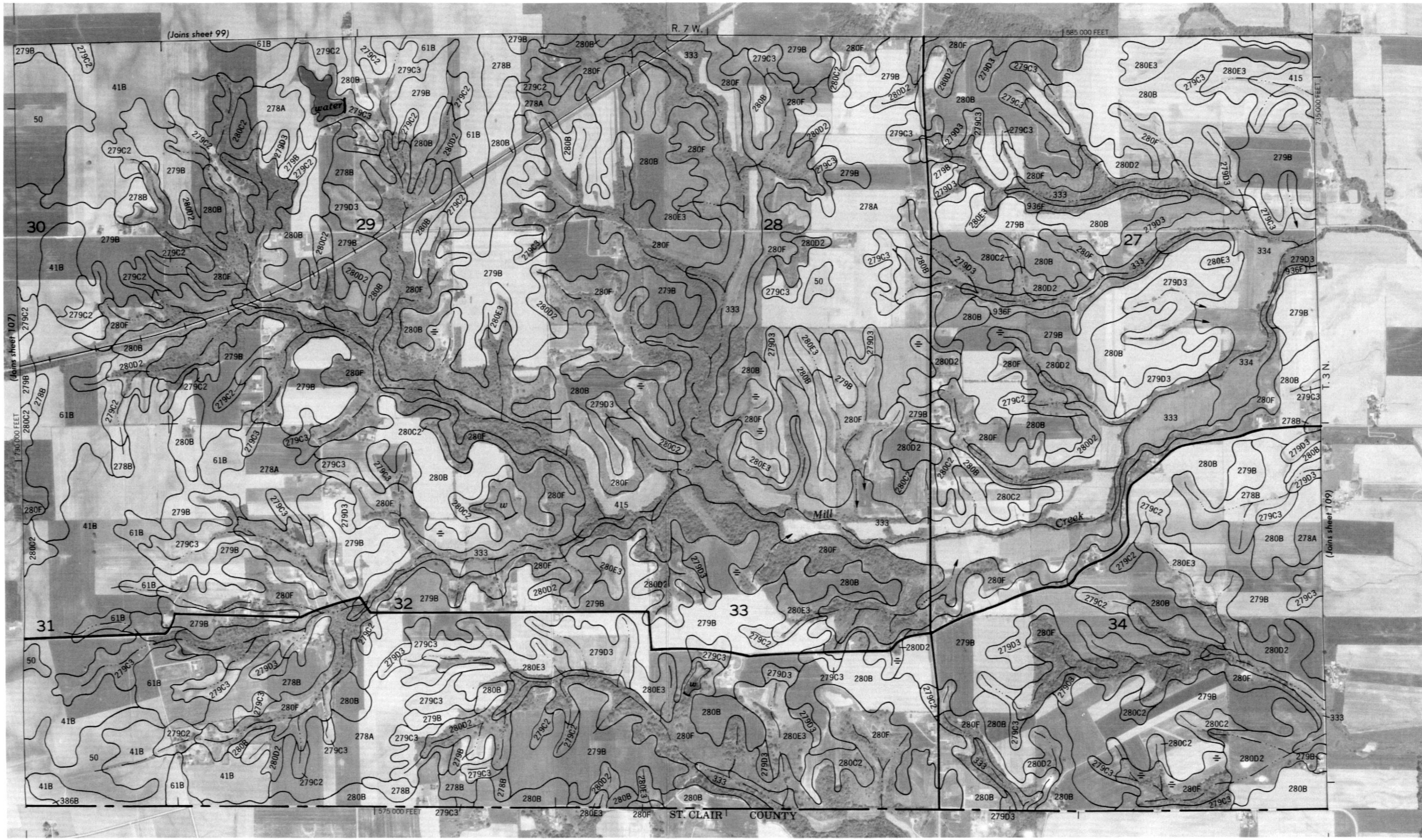
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

108

N



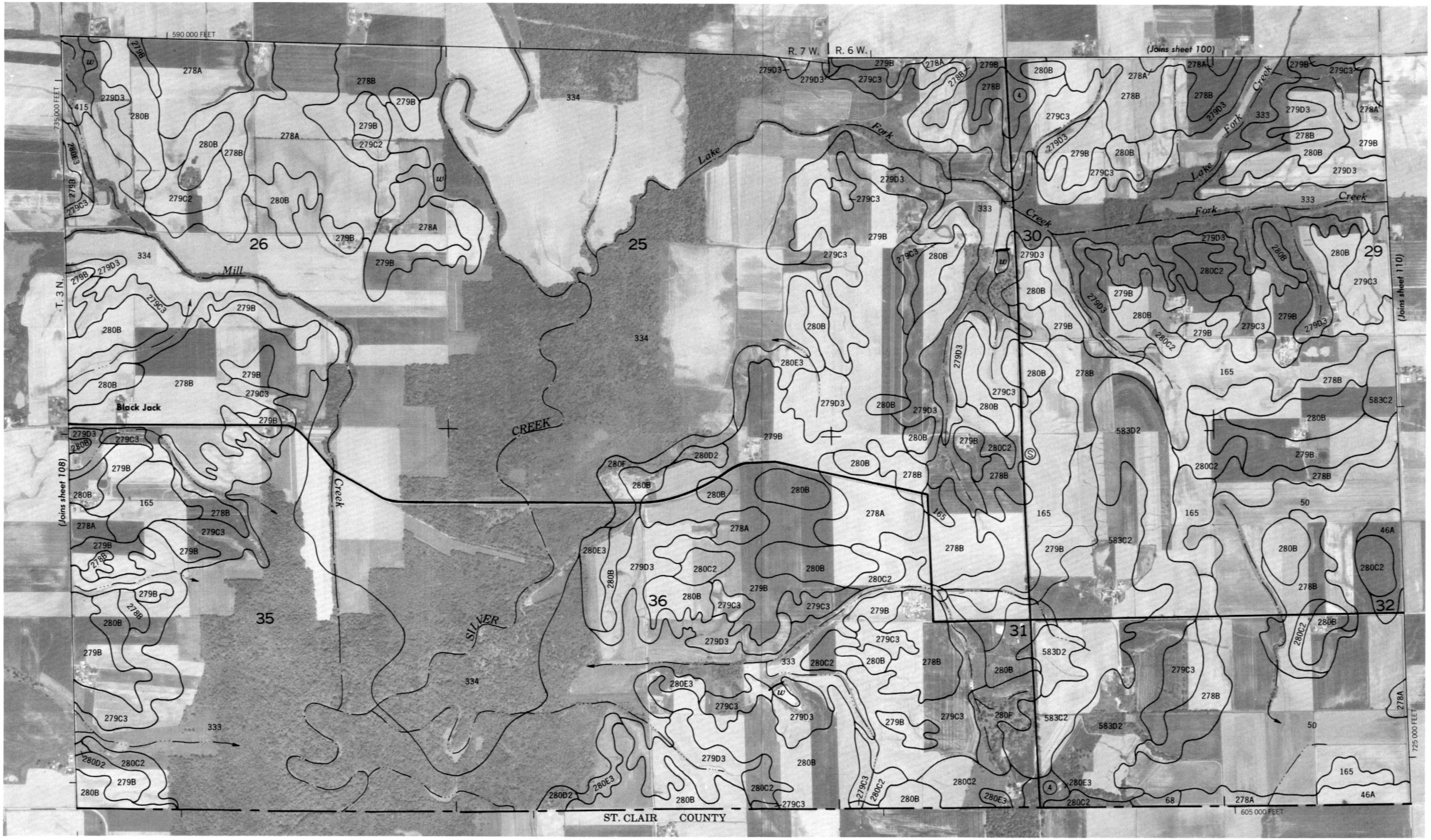
1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



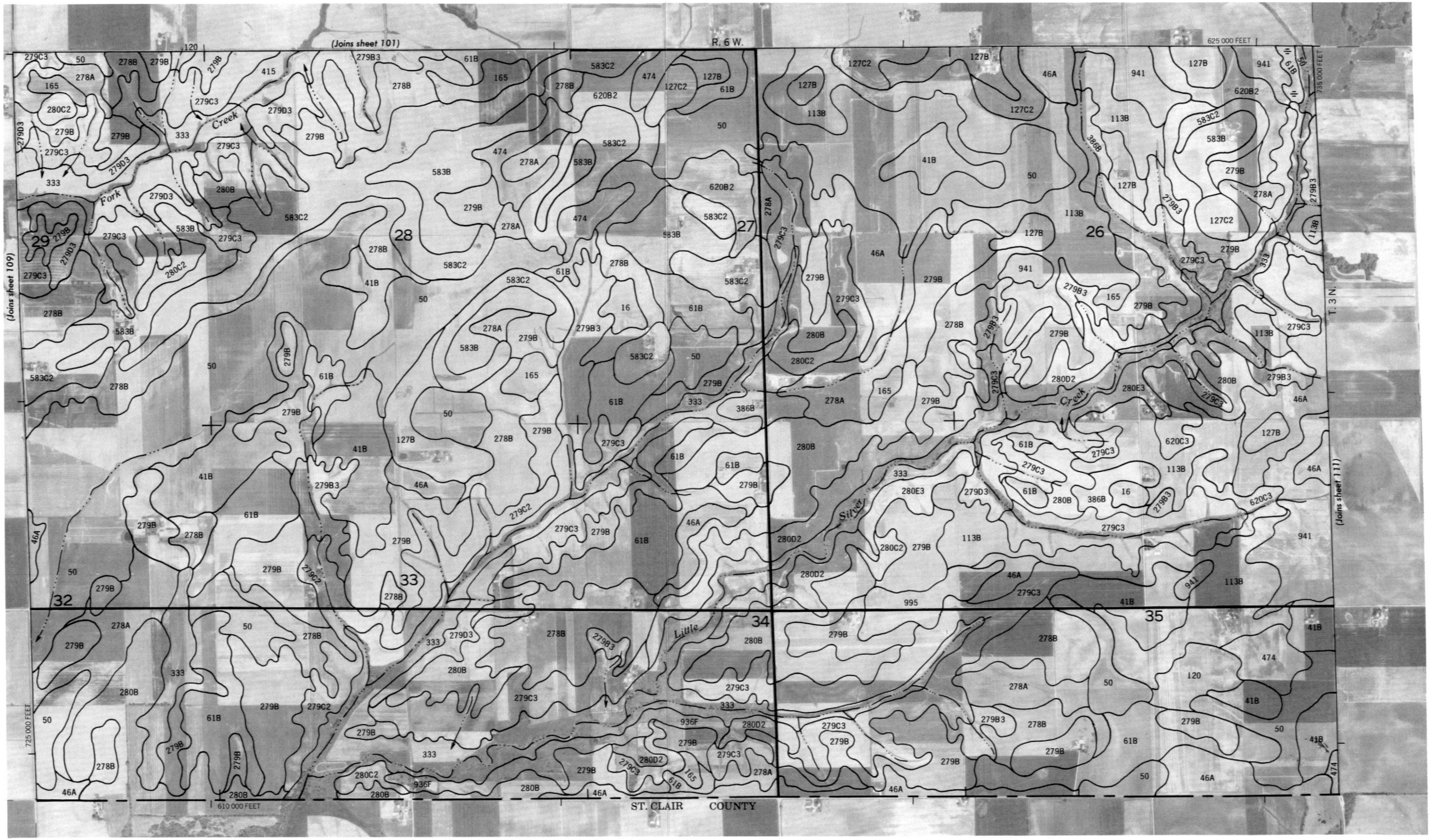
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

N



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 ¾ ½ ¼ 0 1 Mile

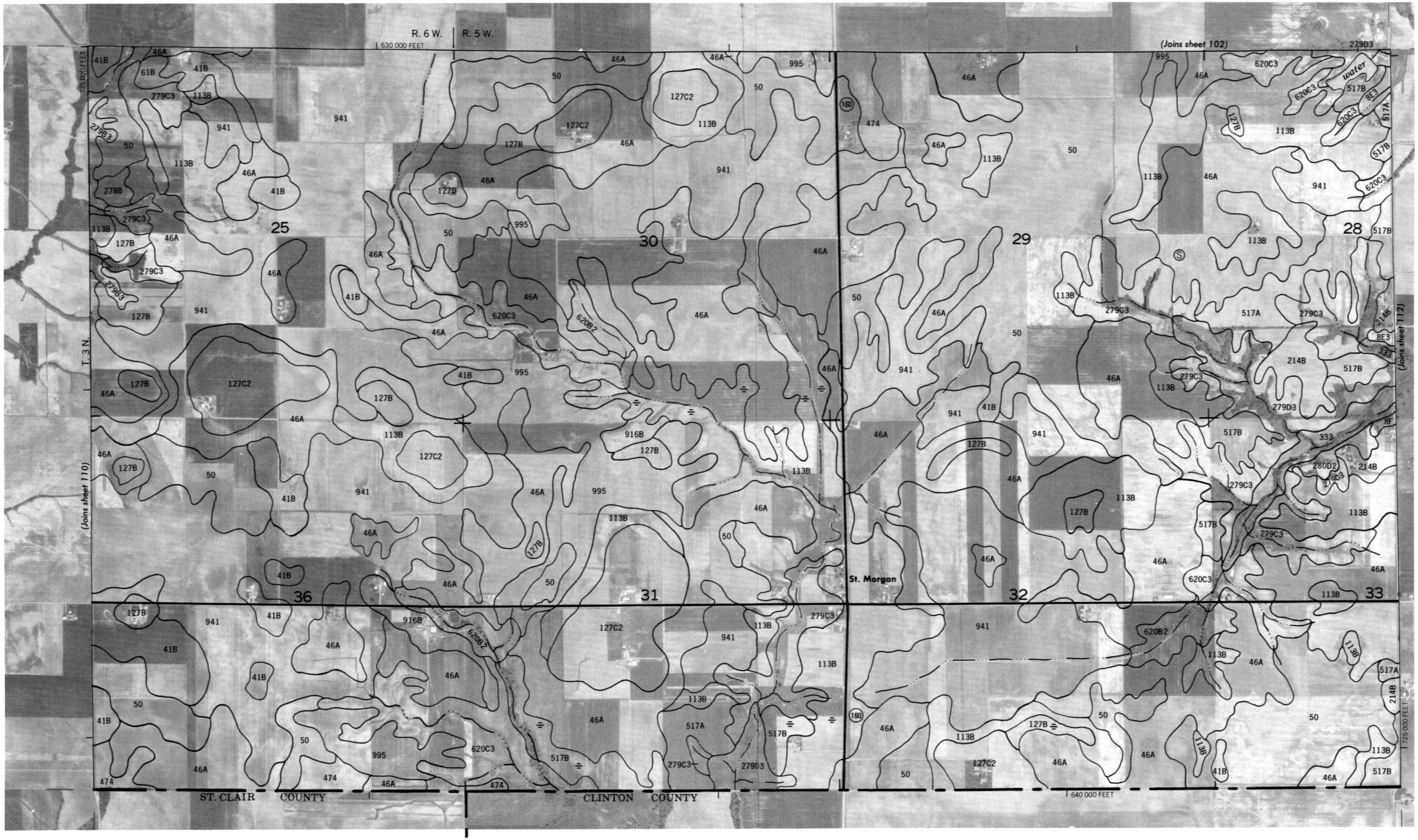
5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840

111

N

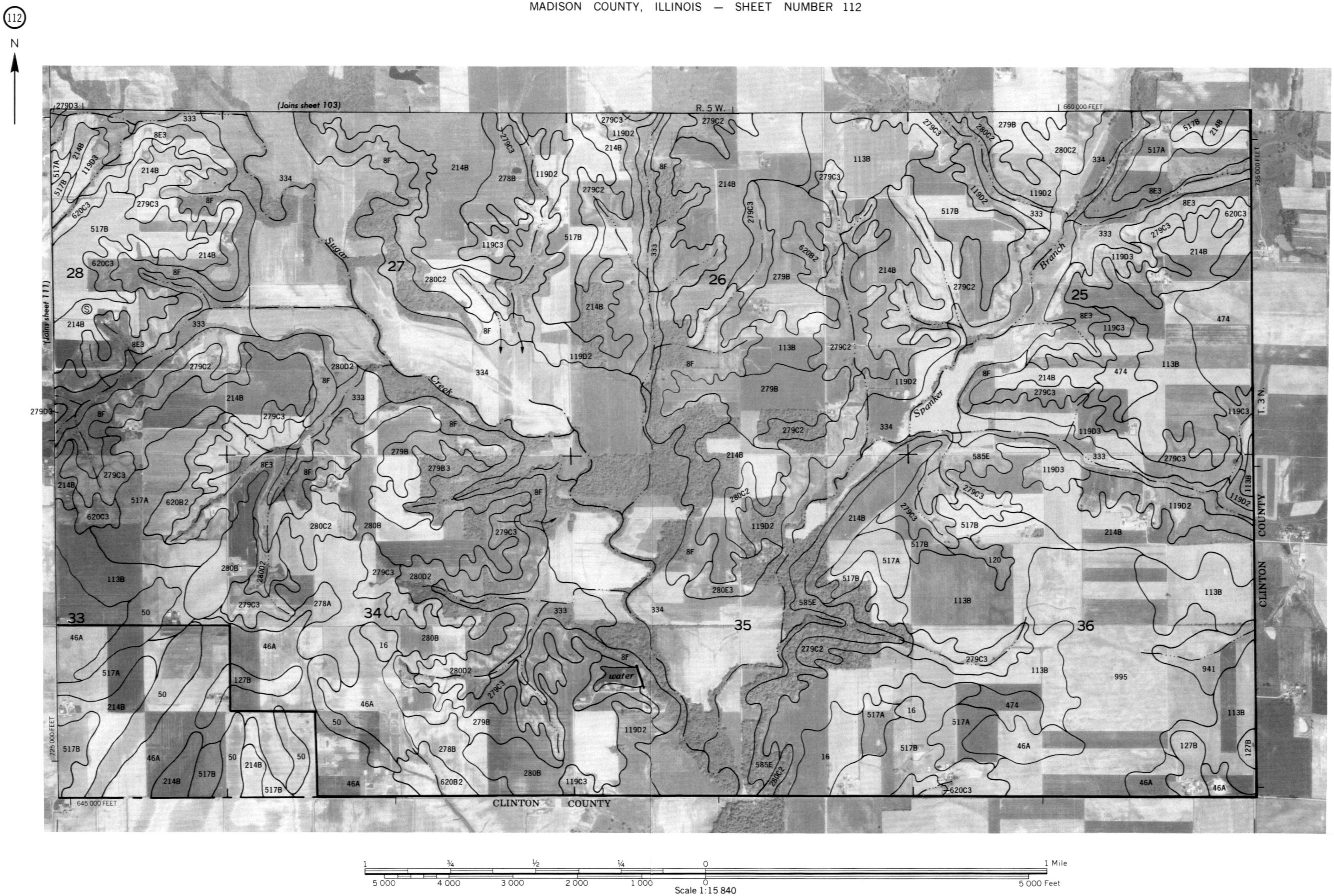
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1 ¾ ½ ¼ 0 1 Mile

5 000 4 000 3 000 2 000 1 000 0 5 000 Feet

Scale 1:15 840



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.